4.10 POPULATION AND HOUSING

4.10.1 Introduction

This section evaluates the potential population and housing impacts from the proposed Helios project. Information presented in the discussion and subsequent analysis was drawn from site visits, census data, estimates prepared by the State of California Department of Finance, and City and Regional projections prepared by the Association of Bay Area Governments (ABAG).

No scoping comments related to population and housing were received in response to the Notice of Preparation (NOP) circulated for this Environmental Impact Report (EIR).

4.10.2 Environmental Setting

Regional Population

There were approximately 7.1 million people living in the nine-county Bay Area region in 2005. The region's population grew at a compound rate of 1.2 percent per year from 1990 to 2000. The Bay Area also experienced substantial increases in employment opportunities in the 1990s. The number of jobs increased at a compound rate of 1.6 percent per year, growing to a total of 3.4 million jobs in the nine-county region in 2005 (ABAG 2007).

Projections prepared by ABAG in June 2007 reflecting a "smart growth forecast" for the Bay Area show regional population growth of almost 2.2 million and an increase of about 800,000 households for the 2000 through 2035 period. For the region as a whole, the projection is for growth of over 30 percent over levels in 2000. In a departure from previous trend-based forecasts, this population and housing scenario reflects a "smart growth" vision: emphasizing infill development to revitalize central cities, support and enhance public transit, and preserve open space and agricultural land. The smart growth scenario assumes that local policies and regulations that currently limit this type of development are changed and that there is significant public investment on a regional and local level in infrastructure and in housing to achieve higher levels of housing production, and particularly high-density housing near transit. The "smart growth" scenario illustrates a development pattern that, over the long term, assumes central Bay Area locations such as San Francisco, Berkeley, Oakland, Emeryville, Alameda, Fremont, Union City, Albany, El Cerrito, and Richmond absorb more housing production and population growth than would otherwise be the case. Regionally and locally, the scenario has implicit benefits in an improved balance of jobs and housing, less in-commuting, and more efficient development patterns that preserve open space and agricultural land (ABAG 2007).

Population and household growth for Berkeley and Albany represent about one percent of the total population and household growth forecast for the Bay Area region. Population growth is expected to continue in the city of Berkeley, building on the trends of the 1990s. The "smart growth forecast" shows an increase of over 13,000 people in the city of Berkeley between 2000 and 2025 (a 13 percent increase over 2000 levels) and an increase of almost 5,000 households in the city (an 11 percent increase over that same period). Using the adjusted 2000 population count for the city of Berkeley as a base, the total population living in the city could reach 119,700 by 2025. In Albany, population is forecast to increase by 14 percent to a total of 18,700 people in 2025. The forecast shows an additional 850 households in Albany between 2000 and 2025, an increase of 12 percent over the period.

Lawrence Berkeley National Laboratory Population

In 2003, there were 3,800 people employed by the Berkeley Lab. Most of these employees (56 percent) were full-time employees in scientific and technical positions. Administrative support positions accounted for 16 percent of the Berkeley Lab employment. Faculty (7 percent of the total), and postdoctoral researchers (6 percent of the total), as well as undergraduate and graduate students (combined representing 15 percent of the total) were also counted among the Berkeley Lab's employees (LBNL 2007).

In 2003, over the course of the year, a total of about 2,500 people used Berkeley Lab facilities as guests. Guests include industry and government researchers working at the Berkeley Lab for short-term assignments, scientists visiting from other academic institutions, or people from other institutions such as UC Davis who use Lab facilities regularly over a period of weeks or months. On an average day, 40 percent of total annual guests use Berkeley Lab facilities. In 2003, this represented about 1,000 people on any given day. LBNL estimates an adjusted total daily population of 4,375 people for 2003, counting both employees and guests; of the total, 3,650 adjusted daily population (ADP) are on the Berkeley Lab's main site on any given day (LBNL 2007).[1]

LBNL employees and their dependents represented 2 percent of the Berkeley and Albany population in 2003. In all other residential locations, Lab employees and their dependents accounted for less than one percent of the total population. Lab employees and their dependents represented 0.3 percent of the total population of Emeryville, Oakland and Piedmont; 0.6 percent of the total population of El Cerrito, Richmond, and San Pablo; and 0.7 percent of the total population of Lafayette, Moraga, and Orinda. For the Bay Area region as a whole, Lab employees and the other members of their households represented 0.1 percent of total regional population in 2003 (LBNL 2007).

1 The LBNL estimate of adjusted daily population (ADP) is defined to include FTE employment plus 40 percent of total annual guests.

4.10.3 Regulatory Considerations

Local Plans and Policies

The proposed project would be located at LBNL, which is operated by the University of California and conducts work within the University's mission on land that is owned or controlled by The Regents of the University of California. As a state entity, the University is exempted by the state constitution from compliance with local land use regulations, including general plans and zoning. However, the University seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. LBNL is located in both the city of Berkeley and the city of Oakland. The following sections summarize policies from the city of Berkeley and city of Oakland General Plans that relate to population and housing.

City of Berkeley General Plan

The city of Berkeley Draft General Plan was published in October 2000 and on December 18, 2001; the Berkeley City Council certified the General Plan EIR and approved the Housing, Land Use, and Transportation Elements. In spring 2002, the City Council approved the six remaining elements of the General Plan.

The Housing Element expresses a key local policy objective related to population and housing impacts (LBNL 2007).

> *The University of California and other institutions should take responsibility for housing demands they generate which create additional pressure on the private housing market in Berkeley. By doing so, they would help avoid causing or increasing housing problems for other Berkeley residents. The City will work with the University and other State institutions to create new housing and jointly address housing issues of mutual concern (LBNL 2007).*

Specific policies and actions addressing this relationship with other institutions are as follows:

> Policy H-33 University of California: Urge the University of California to maximize the supply of appropriately located, affordable housing for its students, and to expand housing opportunities for faculty and staff;
>
> Policy H-34 Group Quarters: Support and encourage construction of group housing near the University for student housing;

Policy H-35 University Housing and Taxes: Support development of new housing for University-related households and other institutions that will not take additional land off tax rolls; and

Policy H-36 University Housing and Displacement: Support University-related housing that avoids displacement of existing residents of a loss of existing rental housing resources available to other City residents.

A related Land Use Element policy also addresses University housing:

Policy LU-37 University Housing: Encourage the University to maximize the supply of housing for students, faculty, and staff to minimize the impacts of the University on the citywide supply of housing.

Oakland General Plan

The Oakland General Plan Land Use and Transportation Element was approved in March 1998. Policy language is focused on economic development (Industry and Commerce policies), Transportation and Transit-Oriented Development, Downtown, the Waterfront, and the Neighborhoods, as well as Housing; there is limited discussion of institutional uses and employment:

Policy N2.3 Supporting Institutional Facilities: The City should support many uses occurring in institutional facilities where they are compatible with surrounding activities and where the facility site adequately supports the proposed uses;

Policy N2.5 Balancing City and Local Benefits of Institutions: When reviewing land use permit applications for the establishment or expansion of institutional uses, the decision-making body should take into account the institution's overall benefit to the entire Oakland community, as well as its effects upon the immediately surrounding area; and

Policy N2.8 Long Range Development Planning: Require, where legally allowed, and encourage in all other situations, those institutions designated with the "Institutional" land use classification should be required to present Long Range Operation and Development Plans to the City Planning Commission. While these plans could be binding or non-binding, they should present realistic information regarding the continued operation and/or expansion of the facilities. The City suggests that substantial public input be built into the process of developing the plans. The plans could be required as a part of the development applications, or on a periodic basis.

4.10.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on population and housing would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the *California Environmental Quality Act* (*CEQA) Guidelines* and the UC CEQA Handbook:

- Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Issues Not Discussed Further

The Helios project Initial Study found that implementation of the proposed project would not displace any existing housing or people, which would necessitate the construction of replacement housing elsewhere. The proposed project does not include housing or long-term residential uses and no housing or individuals would be displaced as a result of its implementation.

Project Impacts and Mitigation Measures

Helios Impact POP-1: The proposed project would not induce substantial population growth in an area, either directly or indirectly. (*Less than Significant*)

The proposed project does not include residential uses, and would not involve an extension of other infrastructure such as water and sanitary sewer that could indirectly induce substantial population growth. The project includes a new roadway; however, that would serve only the project site and would therefore not induce any other population growth other than the population directly added by the project.

The proposed project would generate incidental, short-term construction employment that would create an undetermined number of new jobs. Operation of the project would involve up to 500 people (employees, graduate students, and visitors). Of the projected Helios population, it is estimated that 132 employees would come from existing laboratories and offices within LBNL or UC Berkeley. The remaining 368 new employees, graduate students, and visitors that would be associated with the proposed project would be "new" to the Berkeley Lab site. The increase in new employees, graduate

students, and visitors due to the proposed project would add potential new persons to the Bay Area. Assuming conservatively that each new person associated with the Helios project does not reside within the nine-county Bay Area at the time he/she begins working in the proposed facility and each such person decides to relocate into the Bay Area to be close to the Helios Facility, 368 new persons would not add substantially to the total population of the Bay Area and would represent 0.0052 percent of the Bay Area's 2005 population as estimated by ABAG. The population added by the project to any individual city within the Bay Area would be even a smaller percentage. Based on current residential trends for LBNL employees, approximately 35 percent (129) of the new persons would be Berkeley residents and approximately 14 percent (52) would be Oakland residents (LBNL 2007). These new persons would not add substantially to the total population of Berkeley (0.03 percent) or Oakland (0.01 percent), and the population added by the project to any other individual city within the Bay Area would likely be a smaller percentage of the new persons. Therefore, the proposed project would not induce a substantial population growth, either directly or indirectly in the project region and its impact with respect to this criterion is considered less than significant.

Mitigation Measure: No project-level mitigation measure required.

4.10.5 References

Association of Bay Area Governments. 2007. ABAG Projections 2007. June http://www.abag.ca.gov/planning/currentfcst/regional.html.

City of Berkeley. 2001. General Plan Housing Element Appendix.

Lawrence Berkeley National Laboratory. 2007. 2006 Long Range Development Plan Final Environmental Impact Report. SCH No. 2000102046. July.

4.11 PUBLIC SERVICES

4.11.1 Introduction

This section evaluates the environmental effects associated with any improvements required to meet increases in demand for public services, including fire protection, police, schools, and parks as a result of implementation of the proposed Helios project. Information presented in the discussion and subsequent analysis was drawn from site visits and personal communication with Lawrence Berkeley National Laboratory (LBNL) staff.

No scoping comments related to public services were received in response to the Notice of Preparation circulated for this EIR.

4.11.2 Environmental Setting

Fire Protection

The Alameda County Fire Department (ACFD) works under contract to LBNL to provide firefighting services. This includes staffing their fire station (Station 19) on a continuous basis. Station 19 is located within the Berkeley Lab about 2,400 feet from the proposed Helios facility. This contract requires an engine company staffed by four firefighters. Three of these firefighters must be Hazardous Materials Emergency Response (HAZMAT) certified and one is a paramedic. Equipment at Station 19 includes one fire engine, one reserve fire engine, a hazardous materials vehicle, and a light-duty four-wheel drive "brush patrol unit" that can be used for wildland fires. Following an Automatic Aid Agreement between LBNL and the city of Berkeley, Station 19 is the designated first responder to calls within Berkeley Lab, portions of the UC Berkeley campus and portions of North Berkeley. This first response area includes the Helios building. Approximately 25 percent of responses from Station 19 are to locations at the Berkeley Lab, about 40 percent of the calls are to the UC Berkeley campus, and the remaining calls are to locations within the city of Berkeley outside either LBNL or the Berkeley campus (LBNL 2007).[1]

ACFD will provide emergency response services to the Helios building, augmented by Berkeley Fire Department following the Automatic Aid Agreement. The Berkeley Fire Department provides paramedic transport for LBNL; therefore, if a patient in a medical emergency requires transport to a hospital, a city of Berkeley ambulance will respond. ACFD has a continuously staffed HAZMAT response vehicle located in San Leandro that is available for larger HAZMAT incidents. HAZMAT automatic aid is also

[1] While this analysis represents 2003 baseline data, more recent data are available: In 2005, with 578 total calls, Station 19 responded to 162 (28%) Berkeley Lab calls, 130 (23%) UC Berkeley campus calls, and 286 (49%) city of Berkeley calls (LBNL 2007).

available through the Berkeley Fire Department. An annual HAZMAT exercise is conducted with the appropriate Berkeley Lab staff and the ACFD. Additionally, the Berkeley Lab has an "around-the-clock" contract with a private vendor for HAZMAT clean up.

Law Enforcement

Police services at LBNL are provided through a contract with the UC Berkeley Police Department (UCPD), as well as with a private security provider responsible for outside security needs including Laboratory access, property protection, and traffic control. The UCPD handles all patrol, investigation, and related law enforcement duties for UC Berkeley, LBNL, and other University-owned properties. UCPD operates 24 hours a day, seven days a week, coordinating closely with the city of Berkeley Police Department. UCPD and the Oakland Police Department are members of the California Law Enforcement Master Mutual Aid Plan; all law enforcement agencies in the state belong to this plan to provide each other information and resources when needed. Additionally, the Berkeley Lab has an annual renewable contract with UCPD that provides, when requested, law enforcement emergency response, limited patrols, criminal investigations, and VIP protection. UCPD and the Berkeley Police Department have an agreement regarding jurisdiction over off-site locations occupied by UC staff and Lab staff; this agreement is reviewed and updated annually. The Berkeley Lab does not have an agreement with Oakland Police Department.

LBNL is protected by a perimeter fence that provides access through vehicle entrance points, hardware lock-and-key sets at critical doors, and by an electronic system pre-coded to permit entry only to authorized cardholders. Vehicular access onto the LBNL site is controlled by security personnel at the three vehicle entrance gates who visually inspect entering vehicles.

UC Berkeley Police Department Staffing

UCPD includes 77 police officers, 45 full-time non-sworn personnel, and 60 student employees. The UCPD building is located at 1 Sproul Hall on the UC Berkeley campus. UCPD has primary law enforcement jurisdiction on the campus and associated University properties, including LBNL. UCPD is organized into four divisions: Administration, Community Outreach and Emergency Services, Investigative and Support Services, and Patrol. When services are requested or required, UCPD sends the appropriate resources to the Berkeley Lab to address the situation and/or incident.

On-Site Security Staffing

The LBNL on-site security staff consists of approximately 34 personnel who are divided into 3 to 10 personnel per shift. Staffing and resources consist of an on-site portfolio manager, two to three roving

patrols 24 hours per day and gate access at the Blackberry Canyon Gate 24 hours per day. The LBNL on-site security can respond to any accessible area of LBNL in less than five minutes. UCPD responds to LBNL as needed under the existing contract. The response time for UCPD is also less than five minutes (LBNL 2007).

Schools

The Berkeley Unified School District (BUSD) and Oakland Unified School District (OUSD) provide public elementary and secondary school services to school-aged dependents of LBNL personnel who live in these two communities.

Parks and Recreation

The East Bay Regional Park District (EBRPD) manages over 95,000 acres within Alameda and Contra Costa counties, including 65 regional parks, recreational areas, wilderness, shorelines, preserves, and land bank areas. The EBRPD regional park properties within the vicinity of the LBNL site include Tilden Park and the Claremont Canyon Preserve.

UC Berkeley manages parks and athletic and recreational facilities that serve the University and the wider community. The University also owns the 2.3-acre People's Park located south of the UC Berkeley campus. Athletic and recreational facilities are located within the central campus and within the Strawberry Canyon Recreation Area. Additional resources include the Ecological Study Area.

The City of Berkeley's Parks, Recreation and Waterfront Department manages the city's parks and open space. The City has 243 acres of city-owned and/or maintained parks and open space throughout Berkeley, excluding the 99-acre Aquatic Park. There are 52 parks providing traditional activities such as athletic fields, swimming pools, and tennis and basketball courts, as well as numerous tot and school-age play areas, community gardens, rock climbing, and a variety of water sports at the Berkeley Marina. The City of Berkeley maintains the parks-to-population ratio of 2 acres of parkland per 1,000 persons that was established in the 1977 City of Berkeley Master Plan (City of Berkeley 2002).

The City of Oakland's Office of Parks, Recreation and Cultural Affairs manages the City's parks and recreation centers. According to the Open Space, Conservation and Recreation (OSCAR) Element of the Oakland General Plan, an estimated 3,073 acres of total parklands are available within Oakland's city limits, providing about 8.26 acres of parkland per 1,000 residents; local-serving parks provide an estimated 1.33 acres per 1,000 residents.

Project Site

The proposed project would accommodate a population of approximately 500 permanent researchers, and involve construction of about 160,000 gross square feet (gsf) of new building space. The LBNL personnel and the new building space developed under this project would be served by public services agencies in the Cities of Berkeley and Oakland, Alameda County, and the Berkeley Lab in the manner discussed above.

4.11.3 Regulatory Considerations

Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL and its proposed projects (i.e., Helios facility) seek to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western half of the LBNL site is within the Berkeley city limits, and the eastern half is within the Oakland city limits. This section summarizes relevant policies contained in the 2006 Long Range Development Plan (LRDP), and Berkeley and Oakland General Plans.

2006 LRDP Principles and Strategies[2]

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The principle most applicable to the public services and recreational aspect of new development is to "Build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. Development strategies set forth in the 2006 LRDP that are applicable to public services and recreation include the following:

- Configure and consolidate uses to improve operational efficiencies, adjacencies and ease of access;
- Increase development densities within the most developed areas of the site to preserve open space, enhance operational efficiencies and access;

[2] While this Environmental Impact Report presents a "stand alone" impact analysis that does not rely upon tiering from any programmatic CEQA document, Berkeley Lab does actively follow the 2006 LRDP as a planning guide for Lab development. Accordingly, relevant 2006 LRDP principles, strategies, and design guidelines are identified in this section.

- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates; and
- Develop all new landscape improvements in accordance with the Laboratory's vegetation management program to minimize the threat of wildland fire damage to facilities and personnel.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LDRP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The document provides the following specific planning and design guidance relevant to the public services and recreational aspects of new development:

- Provide appropriate Site Lighting for safety and security; and
- Design all new streets to accommodate two-way traffic flow and pedestrian access.

City of Berkeley General Plan

Berkeley General Plan policies relevant to the proposed project with regard to public services include the following:

> Policy LU-15: Ensure that neighborhoods are well served by basic goods, a diverse supply of community care, services and facilities, including park, school, child care, and church facilities; fire, police, and refuse collection services; and by existing neighborhood commercial areas.

Fire Protection Services

Berkeley General Plan policies pertaining to fire protection include:

> Policy S-21 Fire Preventive Design Standards: Develop and enforce construction and design standards that ensure that new structures incorporate appropriate fire prevention features and meet current fire safety standards;
>
> *Actions:*
>
> A) Develop proposals to make developed areas more accessible to emergency vehicles and reliable for evacuation. Consider restricting on-street parking, increasing parking fines in hazardous areas, and/or undergrounding overhead utilities. Require that all private access

roads be maintained by a responsible party to ensure safe and expedient passage by the Fire Department at any time, and require approval of all locking devices by the Fire Department. Ensure that all public pathways are maintained to provide safe and accessible pedestrian evacuation routes from the hill areas.

B) Evaluate existing access to water supplies for fire suppression. Identify, prioritize, and implement capital improvements and acquire equipment to improve the supply and reliability of water for fire suppression. Continue to improve the water supply for fire fighting to assure peak load water supply capabilities. Continue to work with East Bay Municipal Utility District (EBMUD) to coordinate water supply improvements. Develop aboveground (transportable) water delivery systems.

C) Provide properly staffed and equipped fire stations and engine companies. Monitor response time from initial call to arrival and pursue a response time goal of four minutes from the nearest station to all parts of the city. Construct a new hill area fire station that has wildland fire fighting equipment and ability.

Policy S-22 Fire Fighting Infrastructure: Reduce fire hazard risks in existing developed areas;

Policy S-23 Property Maintenance: Reduce fire hazard risks in existing developed areas by ensuring that private property is maintained to minimize vulnerability to fire hazards;

Policy S-24 Mutual Aid: Continue to fulfill legal obligations and support mutual aid efforts to coordinate fire suppression within Alameda and Contra Costa Counties, Oakland, the EBRPD and the State of California to prevent and suppress major wild land and urban fire destruction; and

Policy EM-31 Landscaping: Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent erosion of soils, improve habitat, lessen fire danger, and minimize degradation of resources.

Police Services

The Berkeley General Plan does not identify policies regarding police services.

Schools, Parks, and Recreation

Berkeley General Plan policies related to schools, parks, and recreation include:

Policy LU-40: Continue to support maximum opportunities for citizen use of libraries and recreational facilities, the maintenance of the hill lands as open space and the adoption of campus development standards and policies to conserve and enhance present open space resources; and

Policy OS-4 Working with Other Agencies: Work with the Berkeley Unified School District, the University of California, the EBMUD, and the EBRPD to improve, preserve, maintain, and renovate their open space and recreation facilities.

City of Oakland General Plan

The Oakland General Plan Land Use and Transportation Element (LUTE) was approved in March 1998, and the OSCAR Element was approved in 1995 (City of Oakland 1998a and 1995). In addition to policies included in the Oakland General Plan, and listed below, the EIR for the LUTE included mitigation measures to reduce potential impacts on public services to a less than significant level. The mitigation directs the City to consider the availability of public services (police and fire protection services, park and recreation services, and schools) in the affected areas as well as the project's impact on current service levels (City of Oakland 1998b). General Plan policies relating to public services include the following:

Fire Protection Services

Oakland General Plan policies pertaining to fire protection include:

LU Policy N13.1: The development of public facilities and staffing of safety related services, such as fire stations, should be sequenced and timed to provide a balance between land use and population growth and public services at all times. (LUTE); and

Policy CO-10.2: As determined necessary by the City, require individual property owners and developers in high hazard areas to reduce fire hazards on their properties through a range of preventative measures. Landscaping and site planning in these high hazard areas should minimize future wildfire hazards. (OSCAR Element)

Police Services

Oakland General Plan policy regarding police services includes LU Policy N13.1 (see above).

Schools, Parks, and Recreation

The Oakland General Plan does not contain policies regarding schools. General Plan OSCAR Element policies related to parks and recreation include:

Policy REC-3.1: Use level of service standards of 10 acres of total parkland and 4 acres of local-serving parkland per 1,000 residents as a means of determining where unmet needs exist and prioritizing future capital investments;

Policy REC-3.2: Follow a systematic process in allocating park and recreation funds. In general, allocate the greatest expenditures to those areas with the greatest unmet needs and place a priority on projects that maximize reductions in deficiency for the amount of money spent. However, maintain the flexibility to consider such factors as site opportunities, the availability of grants or matching funds, and linkages to other kinds of projects;

Policy REC-3.3: Consider a range of factors when locating new parks or recreational facilities, including local recreational needs, projected operating and maintenance costs, budgetary constraints, surrounding land uses, citizen wishes, accessibility, the need to protect or enhance a historic resource, and site visibility;

Policy REC-4.1: Provide for ongoing, systematic maintenance of parks and recreational facilities to prevent deterioration, ensure public safety, and permit continued public use and enjoyment;

Policy REC-6.1: Promote joint use agreements and similar arrangements between the City, the Oakland Unified School District, and other public agencies to maximize the use of school and other non-park recreational facilities during non-school hours;

Policy REC-6.2: Encourage public-private partnerships as a means of providing new recreational facilities on privately-owned sites. Promote joint use partnerships with local churches, private recreational service providers, and local non-profits;

Policy REC-6.3: In areas where park deficiencies exist, pursue recreational use of open space at surplus schools, military bases, utility and watershed properties, and transmission and transportation corridors. Recreational uses in such locations should not conflict with the functional use of the property and should be compatible with prevailing environmental conditions;

Policy REC 7-1: Provide diverse recreational activities for all ages, with a progression of programs from youth to adulthood. Equitably distribute programs throughout all Oakland neighborhoods;

Policy REC-10.1: Continue to provide General Fund support for park and recreational services, acknowledging the importance of these services to the quality of life in Oakland;

Policy REC-10.2: To the extent permitted by law, require recreational needs created by future growth to be offset by resources contributed by that growth. In other words, require mandatory

land dedication for large scale residential development and establish a park impact fee for smaller-scale residential development, including individual new dwelling units. Calculate the dedication or fee requirement based on a standard of 4 acres of local-serving parkland per 1,000 residents; and

Policy OS-2.5: Increase the amount of urban parkland in the seven flatland planning areas, placing a priority on land in areas with limited public open space, land adjacent to existing parks, land with the potential to provide creek or shoreline access, land with historical or visual significance, land that can be acquired at no cost or reduced cost, land in areas with dense concentrations of people or workers, and land that is highly visible from major streets or adjacent to public buildings.

4.11.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on public services and recreation would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the *CEQA Guidelines* and the UC CEQA Handbook:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
  - Fire protection;
  - Police protection;
  - Schools; or
  - Parks or recreational facilities.
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Project Impacts and Mitigation Measures

Helios Impact PUB-1: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, the construction of which could cause significant environmental impacts. (*Less than Significant*)

Implementation of the proposed project would increase the potential need for emergency fire services. LBNL would continue its contract to ensure equipment, materials and training are sufficient to maintain fire protection service levels for the proposed project. Any small increase in the number of calls related to the implementation of the proposed project could be accommodated without additional staff or facilities. Additionally, the proposed project would be built to comply with applicable building and fire code requirements, which would include, for example, the installation of automatic fire-sprinkler systems. Based on the current and expected demand for fire protection services and discussion with the Alameda County Fire Department (LBNL 2007), it is not anticipated that implementation of the proposed project would result in the need for new facilities, staff or equipment to provide adequate fire protection. Therefore, impacts of the proposed project with respect to new or physically altered fire protection facilities or services would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact PUB-2: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, the construction of which could cause significant environmental impacts. (*Less than Significant*)

Construction of the proposed project and the additional employees and graduate students associated with the proposed project would increase the potential need for police protection services. Police services are provided through the UCPD and a private on-site security firm on a contract basis. The private security firm is responsible for on-site security needs including access to the LBNL site, property protection, and traffic control, and can respond to any road accessible area of LBNL in less than five minutes. Under the existing contract, UCPD responds to LBNL as needed, and response times for UCPD are also less than five minutes. Based on the historic average of calls (approximately 10 calls per year), implementation of the proposed project would not noticeably increase the number of calls for police services. There would be an increased demand for on-site security, which would be addressed in the contract for services between the LBNL and the private security provided, to ensure adequate police protection for the on-site population. Based on the estimated demand for police services and discussion with LBNL, it is not anticipated that implementation of the proposed project would result in the need for new facilities, staff, or equipment to provide adequate police services. Therefore, impacts of the proposed project with respect to new or physically altered police protection facilities and services would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact PUB-3: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities in order to maintain acceptable service ratios or other performance objectives, the construction of which could cause significant environmental impacts. (*Less than Significant*)

The proposed project would not develop residential uses and therefore would not directly generate new student enrollment in the BUSD or OUSD (or other school districts). However, project-related increases in employees could draw more families with school-aged children to the LBNL commute area and project-related households could relocate to the cities of Berkeley and Oakland as a result of new employment generated by implementation of the proposed project. School-aged children in these households would attend BUSD or OUSD schools.

The proposed project would add approximately 368 new employees, graduate students, and visitors to the project region. It is unlikely that all 368 new persons would have children or school-aged children. Furthermore, a portion of the new employees may not relocate and therefore not add any students to the BUSD or OUSD. Based on current residential trends for LBNL employees, approximately 35 percent (129) of the new employees would be Berkeley residents and approximately 14 percent (52) would be Oakland residents (LBNL 2007). These new persons would not add substantially to the total population of Berkeley or Oakland, and the population added by the project to any other individual city within the Bay Area would likely be a smaller percentage of the new persons. It is likely that new students associated with employees of the proposed project could be accommodated in existing school facilities in the BUSD and OUSD and would not require the construction of new school sites. In addition, overall student enrollment in elementary and secondary schools has been declining from year to year since 2001 in both the BUSD and OUSD (LBNL 2007). Therefore, it is not anticipated that implementation of the proposed project would result in the need for new or physically altered public school facilities. The proposed project would therefore have a less than significant impact on schools.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact PUB-4: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered park or recreational facilities in order to maintain acceptable service ratios or other performance objectives, the construction of which could cause significant environmental impacts. (*Less than Significant*)

The proposed project does not include housing development and thus would not directly generate an increase in population that could affect local park or recreational facilities. The proposed project could have indirect effects on parks and recreational facilities related to an increase in employees that could draw more residents into the area and could thus increase demand for such facilities. As discussed in **Section 4.10, Population and Housing**, the Helios project could add up to 368 new employees, graduate students, and visitors that would be associated with the proposed project and would be "new" to the Berkeley Lab site. Based on current residential trends for LBNL employees, approximately 35 percent (129) of the new employees would be Berkeley residents and approximately 14 percent (52) would be Oakland residents (LBNL 2007). These new persons would not add substantially to the total population of Berkeley or Oakland, and the population added by the project to any other individual city within the Bay Area would likely be a smaller percentage of the new persons. Based on the parkland ratios established by the Cities of Berkeley and Oakland, the project could generate a demand for an increase of 0.3 acre of parkland in Berkeley and an increase of 0.5 acre of parkland in Oakland. The additional demand for parks and recreational facilities thus would not require the provision of significant additional parkland or recreational facilities in order to meet service ratios.

Construction of new housing is anticipated in Berkeley, Oakland, and elsewhere in the next 20 years, based on current projections by the Association of Bay Area Governments (ABAG). Projections generated by ABAG are relied upon for preparation of city and county general plans. Under the city of Berkeley and the City of Oakland planning process, planned residential uses in each city would be subject to the City's zoning ordinance and general plan policies. While significant environmental impacts from the development of parkland in urban areas are generally not anticipated, the environmental review processes of the Cities of Berkeley and Oakland, and other jurisdictions, would ensure that environmental impacts associated with the development of residential projects and their demand for recreational facilities, as well as the development of recreational facilities themselves, are mitigated to the maximum extent feasible. It would be speculative to assume that there would be significant and unavoidable impacts from the development of parks or recreation facilities in the region.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact PUB-5: The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. (*Less than Significant*)

As discussed under Helios Impact PUB-4 above, the proposed project could indirectly add up to 368 new residents to the Bay Area. These new residents may use regional and local parks and recreational

facilities throughout the Bay Area. While employees working at the proposed project site could use city-owned recreation facilities in Berkeley and Oakland, the increase in number of users would be very small relative to existing conditions, and usage would be dispersed across local facilities in other Bay Area cities where new Berkeley Lab employees may live. The proposed project's employees would also have access to facilities on the UC Berkeley campus. It is not expected that this magnitude of increased use of local or regional parks or recreational facilities would be great enough to cause substantial physical deterioration. Therefore, the project's impact with respect to this criterion is considered less than significant.

Mitigation Measure: No project-level mitigation measure required.

4.11.5 References

Association of Bay Area Governments. 2007. 2007 Projections. June, http://www.abag.ca.gov/planning/currentfcst/regional.html>

City of Berkeley. 2002. General Plan.

City of Oakland. 1998a. General Plan Land Use and Transportation Element.

City of Oakland. 1998b. General Plan Land Use and Transportation Element EIR, February.

City of Oakland. 1995. General Plan Open Space, Conservation and Recreation Element.

Lawrence Berkeley National Laboratory (LBNL). 2007. 2006 Long Range Development Plan Final Environmental Impact Report, SCH No. 2000102046. Prepared by ESA. July.

4.12 TRANSPORTATION AND TRAFFIC

4.12.1 Introduction

This section describes the existing transportation setting and analyzes the potential impacts of the proposed Helios Energy Research Facility Project (Helios Facility or Helios project) on transportation and traffic.

In response to the Notice of Preparation circulated for this Environmental Impact Report (EIR), some commenters expressed concern that roadways in Strawberry Canyon are already overburdened with traffic and would be more hazardous with the addition of project traffic. Other commenters expressed concern regarding the cumulative construction traffic from numerous projects proposed in this portion of the city of Berkeley. The impacts from construction and operations traffic associated with the proposed project are evaluated in this section, for an evaluation of cumulative traffic impacts, see **Section 5.0, Cumulative Impacts,** in this EIR.

4.12.2 Environmental Setting

This section describes the existing transportation and traffic conditions in the vicinity of the Helios project, including the roadway system, weekday peak hour intersection operations, parking, transit service, and bicycle and pedestrian circulation.

Existing Roadway Network

The Helios project would be located in the southeastern part of the Lawrence Berkeley National Laboratory (LBNL) site in Oakland, California. Access to the proposed project would be provided through the existing LBNL gates and a new access road connecting to Centennial Drive. **Figure 4.12-1, Study Intersection Locations, Lane Configurations and Traffic Control**, shows the LBNL site, the surrounding roadway system, and intersections analyzed as part of this analysis. The regional and local roadways serving the project site, as well as the internal circulation within the site are described below.

Regional Roadways

Interstate I-80 connects the San Francisco Bay Area with the Sacramento region and continues east. Within Berkeley, I-80 is oriented in a north-south direction along the western edge of the city and provides five lanes of travel in each direction. Access from I-80 to the city of Berkeley is provided through interchanges at Ashby Avenue, University Avenue, and Gilman Street. I-80 and the nearby I-80,

Interstate 580 (I-580) interchange operate at capacity during the peak commute hours. I-80 between Emeryville and Albany is also I-580.

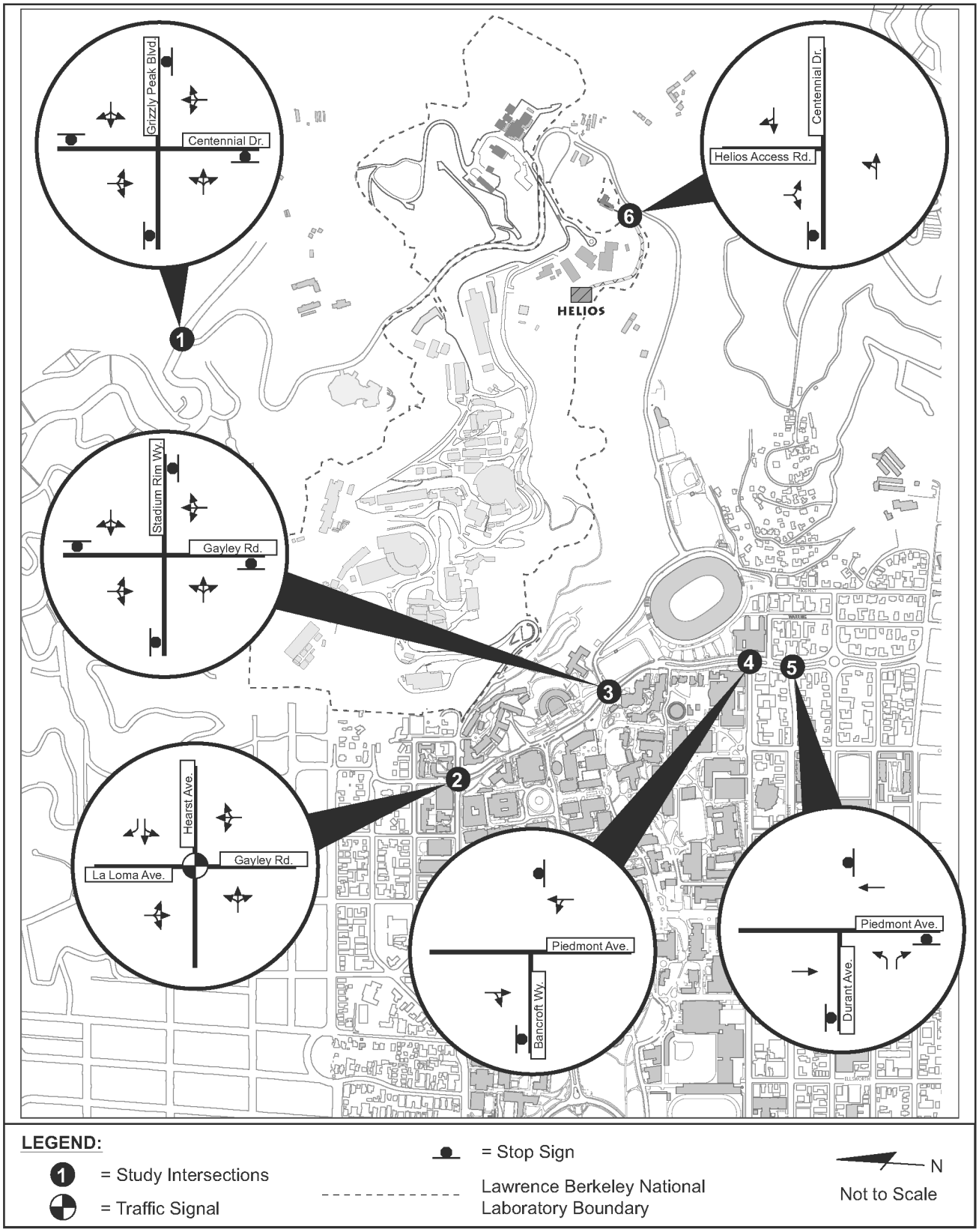
State Route 24 (SR-24) links I-680 in Contra Costa County to I-80/I-580 and I-980. SR-24 provides four travel lanes in each direction near Berkeley. This is the primary route used by Berkeley-bound travelers from Contra Costa County. The primary access routes from SR-24 to the LBNL area are SR-13 (Ashby Avenue) to the Belrose-Derby-Warring-Piedmont corridor, and Telegraph Avenue.

State Route 13/Ashby Avenue (SR-13) connects I-580 in east Oakland to I-80, with a partial access interchange at SR-24. In Berkeley, SR-13 is Tunnel Road/Ashby Avenue, a generally east-west two-lane arterial through the city. Ashby Avenue intersects the major north-south roadways in Berkeley, providing several routes toward LBNL and University of California (UC) Berkeley campus. It is about 1.25 miles south of the Berkeley Lab. During the peak commute hours, on-street parking restrictions on the north side of Ashby Avenue in the morning and the south side in the evening provide an additional travel lane for commuters.

University Avenue provides one of Berkeley's three connections to I-80 to the west (along with Gilman Street and Ashby Avenue). It is an east-west major arterial that extends from the Berkeley Marina and I 80 in the west to the UC Berkeley campus in the east. The divided roadway provides a center median and left-turn pockets at major intersections. Left turns from University Avenue onto cross-streets generally are not served by a separate left-turn signal. University Avenue is a four-lane arterial, with parallel parking provided on both sides of the roadway.

Belrose-Derby-Warring-Piedmont Corridor is a heavily used route connecting SR-24 with Berkeley's Southside area (i.e., the area just south of the UC Berkeley campus), UC Berkeley, and LBNL. With a single travel lane in each direction, the route is at or near capacity for several hours during the morning and evening commute periods. Using roadway signs and notices in official mailings, the City of Berkeley and UC Berkeley have been encouraging travelers to use other routes, like Telegraph Avenue.

Hearst Avenue is a two- to four-lane, east-west street that extends between west Berkeley and LBNL's main entrance at Cyclotron Road, which diverges from Hearst Avenue just east of Gayley Road along the northern boundary of the UC Berkeley campus. Between Gayley Road/La Loma Avenue and LeRoy Avenue, Hearst Avenue provides one travel lane in each direction, with parallel parking on both sides. During the peak commute hours, on-street parking restrictions on the south side of the street in the morning and the north side in the evening provide an additional travel lane. Hearst Avenue is designated as a bicycle lane (Class II) west of Shattuck Avenue and a bicycle route (Class III) east of Shattuck Avenue.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-1**

Study Intersection Locations, Lane Configurations and Traffic Control

Local Roadways

Bancroft Way is an east-west roadway extending from downtown Berkeley through the Southside area, along the southern boundary of the UC Berkeley campus. The roadway is one-way westbound, with two travel lanes from Piedmont Avenue to Telegraph Avenue and three travel lanes from Telegraph Avenue to the Bancroft Way/Oxford Street intersection.

Durant Avenue is a major east-west roadway extending from downtown Berkeley through the Southside area. East of Shattuck Avenue, the roadway is one-way eastbound with three travel lanes. Durant Avenue serves as a "one-way couplet" with Bancroft Way for east-west travel on the south side of the UC Berkeley campus.

La Loma Avenue/Gayley Road is a two-lane, north-south street that extends from Hearst Avenue through north Berkeley. South of Hearst Avenue, La Loma Avenue becomes Gayley Road and borders the east side of the UC Berkeley campus. Parking is allowed on both sides of the street north of Hearst Avenue, but is not allowed south of Hearst Avenue until the vicinity of Memorial Stadium, where Gayley Road becomes Piedmont Avenue.

Stadium Rim Way wraps around the east and north sides of Memorial Stadium and connects the west end of Panoramic Way to Gayley Road near the Greek Theater. It provides access from Gayley Road and Prospect Street to the east side of Memorial Stadium and surrounding parking facilities. Stadium Rim Way also intersects with Centennial Drive, indirectly providing access to the Lawrence Hall of Science (LHS), the Botanical Garden, the Strawberry Canyon Recreational Area, and the LBNL gates on Centennial Drive. On-street parking on Stadium Rim Way is controlled by UC Berkeley. Sidewalks and poles separate pedestrian and vehicle traffic. Near the south end of Stadium Rim Way, the roadway narrows to one lane of traffic in both directions south of Canyon Road.

Centennial Drive borders the east and south perimeters of LBNL. It connects Grizzly Peak Boulevard and Stadium Rim Way and provides access to the LBNL hill site through the Strawberry Canyon and Grizzly Peak gates. Centennial Drive also provides access to LHS, the Botanical Garden, Strawberry Canyon Recreational Area, and Tilden Regional Park. In the vicinity of LBNL, the speed limit is 25 miles per hour. Several sections of the roadway have steep grades and sharp curves, where the speed limit is reduced to 15 miles per hour.

Grizzly Peak Boulevard is a two-lane, two-way roadway located in the hills of Berkeley, connecting Skyline Boulevard in the Sibley Volcanic Regional Preserve in the south, to Spruce Street near the Summit Reservoir in north Berkeley. The narrow and curvy roadway does not provide any pedestrian or bicyclist amenities south of Centennial Drive. The roadway provides access to parking facilities and trails in Tilden Regional Park, and to SR-24.

Internal Circulation

The LBNL hill site is served by an east-west traffic circulation system that generally conforms to the contours of the site's topography. Employees and visitors access the site through three gates. The Blackberry Canyon Gate, on the west of the site, is accessed via Cyclotron Road and connects to Hearst Avenue. The Strawberry Canyon and Grizzly Peak gates, on the east of the site, are accessed via Centennial Drive. The three gates are attended by security personnel during business hours and accessible by a card access system at other times. The site's main vehicle routes are two-way, except for three sections where roadside parking reduces the width, permitting only one-way travel. The one-way portions are confusing for those unfamiliar with the site, and cause additional difficulties and expense for construction projects.

Traffic Operations Analysis

Intersection operations during typical weekday AM and PM peak hours at following six intersections were evaluated:

- Centennial Drive/Grizzly Peak Boulevard
- Hearst Avenue/Gayley Road/La Loma Avenue
- Stadium Rim Way/Gayley Road
- Bancroft Way/Piedmont Avenue
- Durant Avenue/Piedmont Avenue
- Centennial Drive/Helios Access Road

Figure 4.12-1 shows the location of the study intersections and their configuration and control.

Intersection Operation Analysis Method

Transportation engineers and planners commonly use a grading system called Level of Service (LOS) to measure and describe the operation of a local roadway network. The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of traffic.

LOS varies from LOS A, indicating free flow traffic conditions with little or no delay, to LOS F, representing over-saturated conditions where traffic flows exceed design capacity, resulting in long

queues and delays. The LOS grading system is applied to the signalized and unsignalized intersection analysis.

Signalized Intersection traffic conditions and resulting LOS are determined using the *Highway Capacity Manual (HCM)—Special Report 209* (Transportation Research Board, 2000) method for signalized intersections. This method uses intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the control delay per vehicle. Control delay is defined as total delay attributed to signal operations and includes initial deceleration, queue move up time, stopped delay, and acceleration delay. The LOS for a signalized intersection is based on the average control delay per vehicle for the intersection measured in seconds. **Table 4.12-1, Signalized Intersection Level of Service Criteria,** summarizes the LOS criteria for signalized intersections.

Table 4.12-1
Signalized Intersection Level of Service Criteria

Level of Service	Description of Traffic Conditions	Average Control Delay (seconds/vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 – 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 – 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume/capacity ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 – 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.	55.1 – 80.0
F	Operations with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: Highway Capacity Manual *(Transportation Research Board, 2000), Chapter 16 – Signalized Intersections*

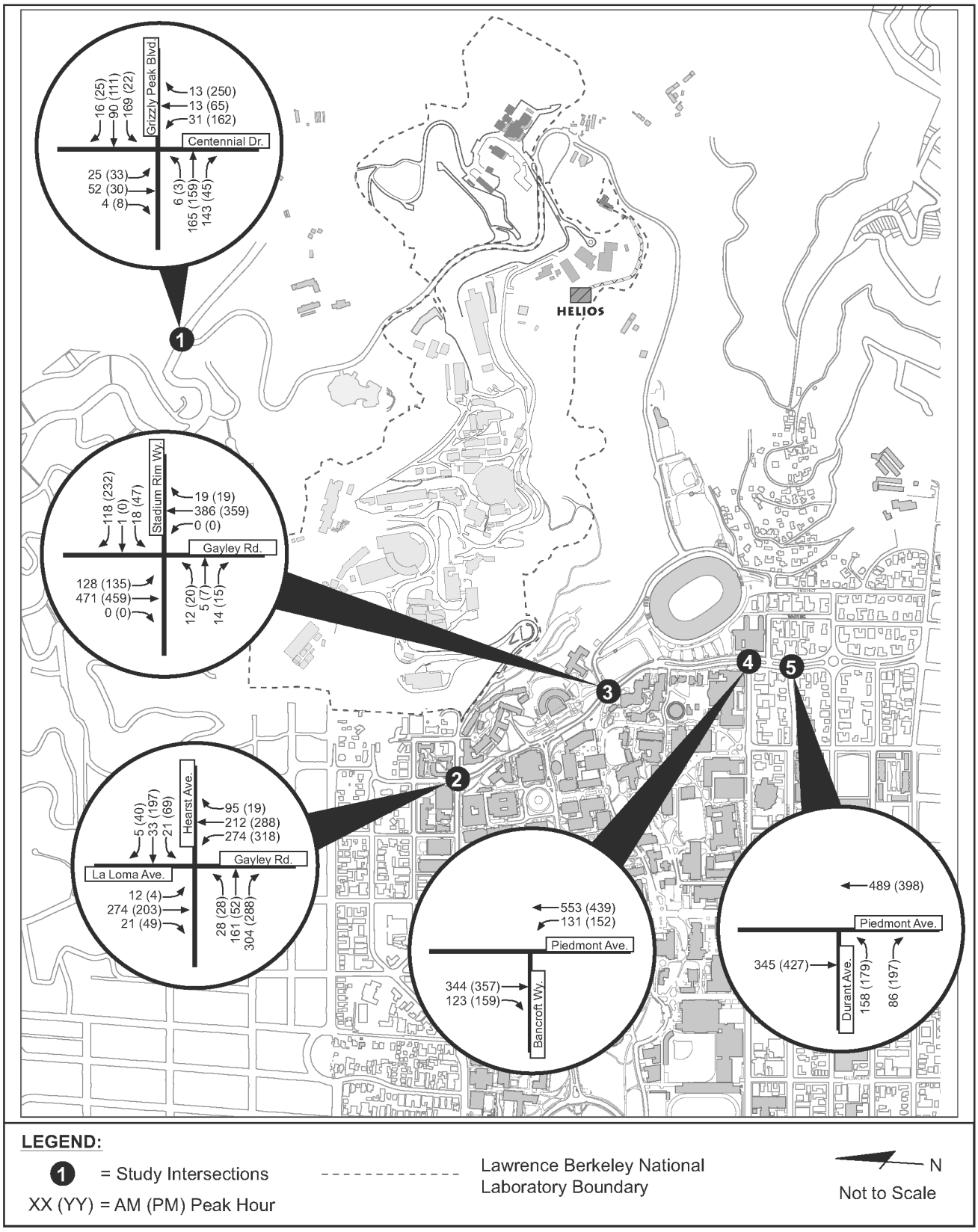
Unsignalized Intersections (four-way stop-controlled and side street stop-controlled) are evaluated using the *HCM – Special Report 209* (Transportation Research Board, 2000) method for unsignalized intersections. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled movement. This incorporates delay associated with deceleration, acceleration stopping, and moving up in the queue. However, the method does not account for additional delays caused by pedestrian crossings. For side street stop-controlled intersections, the delay is typically reported for the worst movement from the minor approaches only. **Table 4.12-2**, **Unsignalized Intersection Level of Service Criteria**, summarizes the relationship between delay and LOS for unsignalized intersections.

Existing Intersection Volumes

The intersection operations analysis presented in this study are based on AM and PM peak period (7:00 to 9:00 AM and 4:00 to 6:00 PM) intersection turning movement volumes collected in 2002 and used in the UC Berkeley 2020 Long Range Development Plan (LRDP) EIR and LBNL 2006 LRDP EIR. Although more recent count data are available, the 2002 data were used because the 2002 traffic volumes are generally higher than the more recent volumes and thus would result in a more conservative analysis.[1] The reduction in traffic volumes since 2002 can be attributed to several factors including the demolition of the 300-space Underhill parking lot in 2005. However, intersection movements that would not be used by traffic associated with the Underhill parking lot were also lower in 2006. The reduction in traffic volumes can also be attributed to upstream bottlenecks metering traffic entering the study area.

Figure 4.12-2, Existing Conditions Peak Hour Traffic Volumes, presents the existing AM and PM peak hour intersection volumes at the study intersections.

1 As part of the LBNL 2006 LRDP EIR, traffic data at all study intersections were collected in October 2006. In general, the 2006 total intersection volumes were lower than the 2002 volumes. Thus, the traffic analysis conducted for the LBNL 2006 LRDP EIR was based on the 2002 data because they were higher. The existing conditions traffic analysis presented in this EIR is consistent with the LBNL 2006 LRDP EIR.
Intersection turning movement data at the study intersections were also collected for the *UC Berkeley Southeast Campus Integrated Projects* (SCIP) EIR in January 2006. Although some movements were slightly higher in 2006, the total AM and PM peak hour intersection volumes were between three and 12 percent lower than the 2002 data.
Peak hour intersection turning movement data were also collected in April 2007 at the Bancroft Way/Piedmont Avenue and Durant Avenue/Bancroft Way intersections. Similar to the 2006 data, the 2007 total intersection volumes were also lower than the 2002 volumes.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-2**

Existing Conditions Peak Hour Traffic Volumes

Table 4.12-2
Unsignalized Intersection Level of Service Criteria

Level of Service	Description of Traffic Conditions	Average Control Delay (seconds/vehicle)
A	Little or no conflicting traffic for minor street approach.	≤ 10
B	Minor street approach begins to notice absence of available gaps.	10 – 15
C	Minor street approach begins experiencing delay for available gaps.	15 – 25
D	Minor street approach experiences queuing due to a reduction in available gaps.	25 – 35
E	Extensive minor street queuing due to insufficient gaps.	35 – 50
F	Insufficient gaps of suitable size to allow minor street traffic demand to cross safely through a major traffic stream.	> 50

Source: Highway Capacity Manual *(Transportation Research Board, 2000), Chapter 17 – Unsignalized Intersections*

Existing Intersection Operations

Table 4.12-3, Existing Conditions – Study Intersection LOS Summary, summarizes existing weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in **Appendix 4.12**. As shown in the table, four of the five study intersections currently operate at LOS D or better during both AM and PM peak hours.

Based on current observations, the all-way stop-controlled Bancroft Way/Piedmont Avenue intersection operates at LOS F during both AM and PM peak hours. Northbound and southbound vehicle flows at this intersection are impeded by the high pedestrian volumes crossing Piedmont Avenue.

Existing Parking Conditions

This section describes on-site and off-site parking conditions.

On-Site Parking

Based on a parking inventory conducted in September 2007, about 2,160 parking spaces are provided at LBNL. The parking supply is slightly less than the parking supply of 2,300 spaces reported in the LBNL 2006 LRDP EIR due to construction staging in parts of several parking facilities.

The parking supply includes marked parking spaces in parking lots, on-street parking spaces, and un-marked informal parking areas. Constrained by the hilly terrain of the site, most parking lots are rather

small and serve nearby buildings. Parking at LBNL is controlled by parking permits. Only site employees and regular visitors can obtain parking permits, which are provided at no cost.

Since these parking spaces are scattered through many parking lots of varying sizes, the last few spaces can be difficult to locate. Thus, the practical capacity of the entire site is considered to be 90 percent of the parking supply. Based on parking occupancy data collected in September 2007, the peak parking occupancy at the site was 81 percent of the parking supply, which is similar to the data collected in 2003 and used in the LBNL 2006 LRDP EIR. Although some parking lots were occupied at or above their "practical capacity," parking spaces were available at more remote parking lots.

Table 4.12-3
Existing Conditions – Study Intersection LOS Summary

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (Seconds)[1]	LOS [1]	Delay (Seconds) [1]	LOS [1]
Centennial Drive/ Grizzly Peak Boulevard	All-Way Stop-Controlled	10.2	B	17.7	C
Hearst Avenue/Gayley Road/La Loma Avenue	Signalized	22.4	C	24.3	C
Stadium Rim Way/ Gayley Road	All-Way Stop-Controlled	26.2	D	34.7	D
Bancroft Way/ Piedmont Avenue [2]	All-Way Stop-Controlled	***>60***	***F***	***>60***	***F***
Durant Avenue/ Piedmont Avenue	All-Way Stop-Controlled	17.4	C	17.6	C

Source: Fehr & Peers, August 2007.

[1] Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle, according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.

[2] Based on the 2000 HCM methodology, the intersection currently operates at LOS D during the AM peak hour and LOS C during the PM peak hour. Based on field observations and measurements, the intersection currently operates at LOS F during both AM and PM peak hours due to the high number of pedestrian crossings, which the 2000 HCM methodology does not account for.

Bold *indicated an intersection operating at unacceptable LOS E or LOS F.*

Off-Site Parking

UC Berkeley provides parking facilities for its students, staff, and faculty. Although about 350 LBNL employees also work at UC Berkeley campus, few park in UC Berkeley campus facilities. This is likely because LBNL parking permits are free, whereas UC Berkeley charges for parking permits. In addition, most UC Berkeley facilities are usually occupied at or near capacity throughout the day.

There are no on-street parking spaces available on roadways providing access to the LBNL site. On-street parking on the surrounding neighborhoods are controlled by either parking meters and limited to one-hour or less in non-residential streets or controlled by residential parking permits and limited to two-hours for non-residents in residential streets. As a result, on-street parking is not a practical option for LBNL employees and visitors.

Existing Transit and Shuttle Services

The LBNL site is served indirectly by Bay Area Rapid Transit (BART), Alameda-Contra Costa Transit (AC Transit), and UC Berkeley Shuttle Service (Bear Transit) and directly by the LBNL shuttle service. **Figure 4.12-3, Transit Routes in Project Vicinity,** shows the transit routes in the vicinity of the project site. Each transit service is described below.

BART

BART provides regional commuter rail transit in Alameda, Contra Costa, San Francisco, and San Mateo counties. Currently, BART trains operate on weekdays from 4:00 AM to midnight, on Saturdays from 6:00 AM to midnight, and on Sundays from 8:00 AM to midnight. The nearest BART station to the Helios project is the Downtown Berkeley station located one block west of the UC Berkeley campus at the Center Street/Shattuck Avenue intersection (approximately 1.25 miles east of the project site). The LBNL shuttle service provides access between the LBNL site and the Downtown Berkeley BART Station.

The Downtown Berkeley BART station is one of the most highly used stations within the BART system with average weekday exits and entries for 2007 of approximately 20,200 passengers. The minimum BART fare is $1.40.

AC Transit

Local bus service in Berkeley is provided by AC Transit. Within the city of Berkeley, at least one AC Transit route provides service within walking distance (0.25 mile) of nearly every resident in the city. Five bus routes provide service to the project area. **Figure 4.12-3** illustrates the existing AC Transit routes in the vicinity of the LBNL hill site. Although these routes do not directly serve the LBNL hill site, the LBNL shuttle service provides access to them.

The following bus routes serve the project area:

- Line 7 provides service between the El Cerrito Del Norte and Rockridge BART station and travels along Piedmont Avenue and Bancroft Way/Durant Avenue couplet in the project area. It operates on 20- to 30-minute headways during the week between approximately 6:30 AM and 9:00 PM. On weekends, Line 7 operates with 60-minute headways between 8:00 AM and 6:00 PM.

- Line 51 provides service between the Berkeley Amtrak Station in West Berkeley and Oakland and Alameda and travels along Piedmont Avenue and Bancroft Way/Durant Avenue couplet in the project area. It operates daily on 8- to 20-minute headways during the day and 60-minute headways through the night as Line 851.

- Line 52L provides service between the University Village in Albany and the UC Berkeley campus and travels along Gayley Road and Bancroft Way/Durant Avenue couplet near the project site. Line 52L operates on 15- to 30-minute headways on weekdays and on 30-minute headways on weekends between 6:00 AM and midnight.

- Line 65 provides service between the Berkeley BART station and LHS through the North Berkeley Hills neighborhood. Headways for this line are 30 minutes on weekdays from approximately 6:00 AM to 9:00 PM. On weekends, the headways are 60 minutes from approximately 7:30 AM to 7:00 PM.

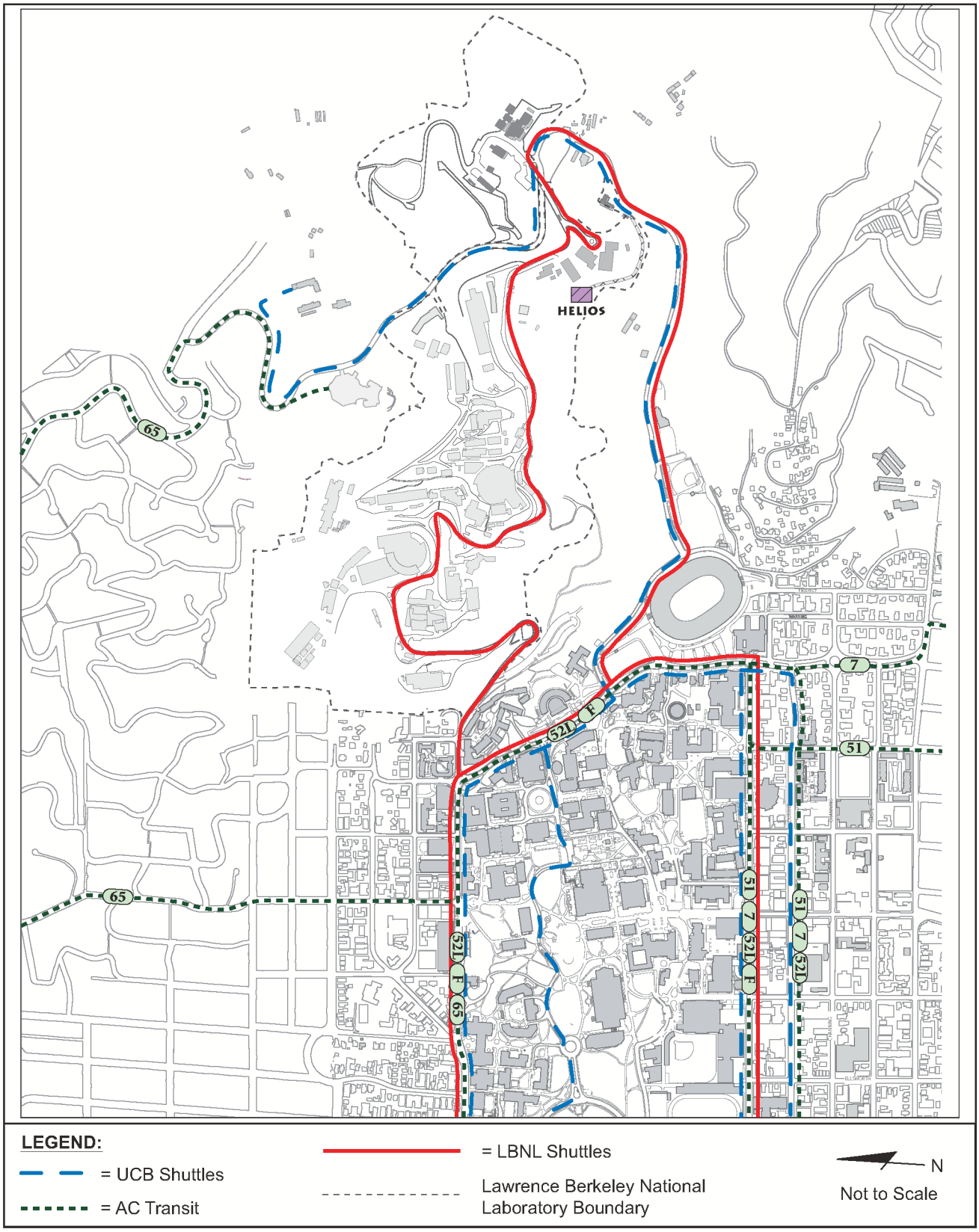
- The Transbay Line F provides service between the UC Berkeley campus and the Transbay Terminal in San Francisco. It operates along Gayley Road and Bancroft Way in the project area. It has 30- to 60-minute headways from 5:00 AM to 1:00 AM on weekdays and the FS-line operates on approximately 30-minute headways on weekdays in the eastbound direction during the PM peak commute and in the westbound direction during the AM peak commute.

Additional AC Transit routes can be accessed in downtown Berkeley and Soutside area through the LBNL shuttles.

BEAR Transit

BEAR Transit, operated by UC Berkeley, primarily serves the UC Berkeley community, providing service between the UC Berkeley campus, surrounding neighborhoods, and select destinations. In general, the daytime shuttles operate on a fixed route and schedule between 7:30 AM and 7:30 PM. The night shuttles operate on a fixed schedule between 7:30 PM and 3:00 AM, and provide door-to-door service throughout the service area between 3:00 AM and 6:00 AM.

All BEAR Transit shuttle buses, except the Richmond Field Station shuttle line, are free to UC Berkeley students, faculty, staff, post-docs, and visiting scholars, who have valid university identification. Others must pay a fair of $1.00. The Bear Transit Line H serves destinations along Centennial Drive, including the UC Berkeley Botanical Garden and LHS.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-3**

Transit Routes in Project Vicinity

LBNL Shuttles

LBNL provides a free on-site and off-site shuttle service connecting the LBNL hill site to UC Berkeley, BART, AC Transit, and local neighborhoods. Current shuttle routes are described below.

- The Green Route operates internal to the hill site on weekdays from 6:40 AM to 7:00 PM with 15-minute headways.
- The Orange Route operates in a counterclockwise loop between the LBNL hill site and the downtown Berkeley BART Station through Hearst Avenue and Centennial Drive on weekdays with 30-minute headways from 6:30 AM to 9:00 AM and 6:00 PM to 7:00 PM and with 15-minute headways from 9:00 AM to 6:00 PM.
- The Blue Route operates in a clockwise loop between the Downtown Berkeley BART Station, north side of the UC Berkeley campus, LBNL hill site, and the Southside area through Hearst Avenue, Centennial Drive, Gayley Road, and Bancroft Way on weekdays with 15-minute headways from 6:00 AM to 5:30 PM and with 30-minute headways from 5:30 PM to 7:30 PM.
- The Rockridge Shuttle operates between the LBNL hill site and the Rockridge BART Station on one-hour headways from 6:40 AM to 9:40 AM and from 3:40 PM to 6:40 PM.

Although the LBNL shuttles are free, they are restricted to LBNL employees and visitors and shuttle riders are required to provide a valid identification to the driver. Shuttle stops are coordinated with AC Transit bus lines serving downtown Berkeley. The LBNL shuttles are equipped with bicycle racks for the ride up the hill. All of the shuttles listed above serve the project vicinity via stops on Lawrence Road near the Molecular Foundry building or on Lee Road near Buildings 62 and 66.

Existing Pedestrian and Bicycle Circulation

Most LBNL employees and visitors either drive or use transit to access the site. The hilly terrain and steep grades make walking or biking to the site rather difficult. Most walking and biking trips to the LBNL site are through the Blackberry Canyon Gate which connects to the City's sidewalks and bicycle facilities through Cyclotron Road and Hearst Avenue. The Strawberry Canyon and Grizzly Peak Gates can also be accessed by bicyclists using Centennial Drive and pedestrians using the intermittent paved sidewalks and unpaved paths along Centennial Drive. Many bicyclists also use the LBNL shuttles that are equipped with bike racks for their uphill inbound trip to the site and use their bicycles for the outbound downhill trip.

Within the site, pedestrian and bicycle paths meander and have many discontinuities. Pedestrian pathways primarily connect parking facilities and buildings. Although these paths are used for shorter trips within the site, the on-site shuttle service is typically used for longer trips.

Within the city of Berkeley, non-residential streets provide sidewalks and crosswalks for pedestrians. Currently, bicyclists are allowed on the roadways within the study area. However, the *2005 Berkeley Bicycle Plan Update* does not identify any on-street bicycle facilities within the project area. Gayley Road, Piedmont Avenue, and Bancroft Way are identified as future Class 2.5 facilities (shared roadways where full bicycle lanes cannot be implemented but other improvements and amenities can be provided) and Stadium Rim Way and Centennial Drive are identified as future Class 3 facilities (signed bike routes). In addition, the recently published *Campus Bicycle Plan* recommends Gayley Road and Stadium Rim Way as future Class 2.5 facilities.

4.12.3 Regulatory Considerations

Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western half of the LBNL site is within the Berkeley city limits, and the eastern half is within the Oakland city limits. This section summarizes relevant principles, polices and guidelines contained in the LBNL 2006 LRDP, and the general plans of the Cities of Berkeley and Oakland.

2006 LRDP Principles and Strategies[2]

The 2006 LRDP proposes four fundamental principles that form the basis for the Plan's development strategies. All four principles are applicable to the traffic-related aspect of new development: (1) "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship;" (2) "Build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions;" (3) "Build a more campus-like research environment;" and (4) "Improve access and connections to enhance scientific and academic collaboration and interaction."

[2] While this Environmental Impact Report presents a "stand alone" impact analysis that does not rely upon tiering from any programmatic CEQA document, Berkeley Lab does actively follow the 2006 LRDP as a planning guide for Lab development. Accordingly, relevant 2006 LRDP principles, strategies, and design guidelines are identified in this section.

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. Development strategies set forth in the 2006 LRDP applicable to transportation and traffic includes the following:

- Increase development densities within the areas corresponding to the existing clusters of development to preserve open space, enhance operational efficiencies, and access;
- Site and design new facilities in accordance with University of California Policy on Sustainable Practices to reduce energy, water and material consumption and provide improved occupant health, comfort, and productivity;
- Increase use of alternate modes of transit through improvements to the Laboratory's shuttle bus service;
- Promote transportation demand management strategies such as vanpools and employee ride share programs;
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates;
- Create a better linkage between parking, shuttle stops, and pedestrian circulation on site;
- Provide separated routes of travel wherever possible for pedestrians and vehicles;
- Promote use of bicycles by providing additional storage racks and shower facilities;
- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic;
- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population;
- Consolidate parking into larger lots and/or parking structures, locate these facilities near Laboratory entrances to reduce traffic within the main site;
- Remove parking from areas targeted for outdoor social spaces and service areas;
- Consolidate service functions wherever possible in the Corporation Yard;
- Use pedestrian routes to connect the various developed terraces of the site which host the central and research clusters;
- Improve the pedestrian spaces at the heart of the research clusters and adjacent to research facilities so as to support interaction among Laboratory users;
- Retain and improve walkways as appropriate throughout the open space portions of the site, carefully integrating these pathways to minimize intrusion in the natural environment;

- Improve pedestrian access and safety throughout the Laboratory site by developing new routes and enhancing existing routes;
- Improve wayfinding through a comprehensive and coordinated signage system and through the naming of buildings and research clusters; and
- Improve the path providing access to and from the UC Berkeley campus.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the 2006 LRDP and provide specific guidelines for site planning, landscape and building design as a means to implement the 2006 LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the 2006 LRDP.

The design guidelines would be applied to the proposed project as part of the 2006 LRDP program. As part of the design review and approval process, the proposed project would be evaluated for adherence to the LRDP Land Use Map, the design guidelines, the Building Heights Map, and other relevant plans and policies. Approvals would be subject to satisfactory compliance with these provisions. Design objectives that are contained within the design guidelines and applicable to the transportation and traffic analysis include the following:

- Stimulate pedestrian activity and interaction in the Commons Spaces;
- Create as high a density and critical mass around commons spaces as possible;
- Segregate public entries and paths from service entries and paths where feasible;
- Where segregation is not possible, and service and public access overlap in accessing buildings, design service courts to intelligently serve both;
- Design Pathway Layouts that support pedestrian flow and encourage casual interaction;
- Design all new streets to accommodate two-way traffic flow and pedestrian access;
- Reduce the amount of impermeable surfaces at the Berkeley Lab;
- Minimize visual and environmental impacts of new parking lots;
- Create parking plazas to accommodate multiple functions where restricted sites do not allow for them to be segregated; and
- Site and design parking structures to integrate with the natural surroundings.

City of Berkeley General Plan

About 95 acres, or almost half of the LBNL site, is within the city of Berkeley. The Land Use Element of the Berkeley General Plan contains comprehensive objectives and policies that guide physical development in the city. One objective of the Land Use Element is to "minimize the negative impacts and maximize the benefits of University of California on the citizens of Berkeley."

The Transportation Element of the Berkeley General Plan contains the following policies relevant to the proposed Helios project:

> Transportation Objective 1: Maintain and improve public transportation services throughout the city;
>
> Transportation Objective 2: Reduce automobile use and vehicle miles traveled in Berkeley, and the related impacts, by providing and advocating for transportation alternatives and subsidies that facilitate voluntary decisions to drive less;
>
> Transportation Objective 6: Create a model bicycle- and pedestrian-friendly city where bicycling and walking are safe, attractive, easy, and convenient forms of transportation and recreation for people of all ages and abilities;
>
> Policy T-2 Public Transportation Improvements: Encourage regional and local efforts to maintain and enhance public transportation services and seek additional regional funding for public and alternative transportation improvements.
>
> *Action T-2 D*: Improve shuttle and transit services by:
>
> 1. Increasing shuttle and transit services from Rockridge and the Rockridge BART station to downtown BART and the UCB campus.
>
> 3. Promoting express shuttle services to complement local transit service and ensure that Berkeley residents and commuters have information about shuttle services readily available;
>
> 5. Encouraging transportation providers to coordinate and consolidate the installation of new jointly used shelters;
>
> Policy T-10 Trip Reduction: To reduce automobile traffic and congestion and increase transit use and alternative modes in Berkeley, support, and when appropriate require, programs to encourage Berkeley citizens and commuters to reduce automobile trips, such as:
>
> 2. Participation in the Commuter Check Program.

3. Carpooling and provision of carpool parking and other necessary facilities.

4. Telecommuting programs.

8. Programs to encourage neighborhood-level initiatives to reduce traffic by encouraging residents to combine trips, carpool, telecommute, reduce the number of cars owned, shop locally, and use alternative modes.

9. Programs to reward Berkeley citizens and neighborhoods that can document reduced car use.

10. Limitations on the supply of long-term commuter parking and elimination of subsidies for commuter parking;

Policy T-13 Major Public Institutions: Work with other agencies and institutions, such as the University of California, the Berkeley Unified School District, Lawrence Berkeley Laboratory, Vista Community College, the Alameda County Court, and neighboring cities to promote Eco-Pass and to pursue other efforts to reduce automobile trips.

Action T-13A: Encourage other agencies and institutions to match or exceed the City of Berkeley's trip reduction and emission reduction programs for their employees.

Action T-13C: Encourage the University of California:

1. To maintain and improve its facilities and programs that support and encourage pedestrians, bicyclists, and transit riders.

2. To provide bicycle facilities, "all hour" bicycle paths, and timely pavement maintenance.

Action T-13H: Encourage the University of California, the Berkeley Unified School District, and other major institutions to cap parking at current levels while seeking to reduce automobile use.

Action T-13I: Encourage institutions to create incentives for their employees and students to live locally.

Action T-13J: Encourage all public and private institutions, including schools, health clubs, recreation centers, and other community destinations to organize carpools and shuttles;

Policy T-18 Level of Service: When considering transportation impacts under the California Environmental Quality Act, the City shall consider how a plan or project affects all modes of transportation, including transit riders, bicyclists, pedestrians, and motorists, to determine the transportation impacts of a plan or project. Significant beneficial pedestrian, bicycle, or transit

impacts, or significant beneficial impacts on air quality, noise, visual quality, or safety in residential areas may offset or mitigate a significant adverse impact on vehicle LOS to a level of insignificance. The number of transit riders, pedestrians, and bicyclists potentially affected will be considered when evaluating a degradation of LOS for motorists;

Policy T-28 Emergency Access: Provide for emergency access to all parts of the city and safe evacuation routes;

Policy T-37 University of California and Large Employer Parking: Encourage large employers, such as the University of California and Berkeley Unified School District, to allocate existing employee parking on the basis of a) need for a vehicle on the job, b) number of passengers carried, c) disability, and d) lack of alternative public transportation.

Action T-37A: Encourage the University of California to cap its parking supply at current levels, to postpone any plans to expand its existing (year 2000) parking supply and instead encourage transit use and alternative modes of transportation, and better manage and utilize existing parking;

Policy T-38 Inter-Jurisdictional Coordination: Establish partnerships with adjacent jurisdictions and agencies, such as the University of California and the Berkeley Unified School District, to reduce parking demand and encourage alternative modes of transportation;

Policy T-41 Structured Parking: Encourage consolidation of surface parking lots into structured parking facilities and redevelopment of surface lots with residential or commercial development where allowed by zoning;

Policy T-42 Bicycle Planning: Integrate the consideration of bicycle travel into City planning activities and capital improvement projects, and coordinate with other agencies to improve bicycle facilities and access within and connecting to Berkeley; and

Policy T-54 Pathways: Develop and improve the public pedestrian pathway system.

City of Oakland General Plan

The following transportation-related policies in the Oakland General Plan Land Use and Transportation Element are relevant to the Helios project:

Policy T2.5 Linking Transportation and Activities: Link transportation facilities and infrastructure improvements to recreational uses, job centers, commercial nodes, and social services (i.e., hospitals, parks, or community centers);

Policy T3.2 Promoting Strategies to Address Congestion: The City should promote and participate in both local and regional strategies to manage traffic supply and demand where unacceptable levels of service exist or are forecast to exist;

Policy T3.6 Including Bikeways and Pedestrian Walks: The City should include bikeways and pedestrian walks in the planning of new, reconstructed, or realigned streets, wherever possible;

Policy T3.6 Encouraging Transit: The City should encourage and promote use of public transit in Oakland by expediting the movement of and access to transit vehicles on designated "transit streets" as shown on the Transportation Plan;

Policy T4.2 Creating Transportation Incentives: Through cooperation with other agencies, the City should create incentives to encourage travelers to use alternative transportation options;

Policy D3.2 Incorporating Parking Facilities: New parking facilities for cars and bicycles should be incorporated into the design of any project in a manner that encourages and promote safe pedestrian activity; and

Policies in the Open Space, Conservation, and Recreation (OSCAR) Element of the Oakland General Plan pertaining to transportation relevant to the Helios project include the following:

Policy CO-12.1: Promote land use patterns and densities which help improve regional air quality conditions by: (a) minimizing dependence on single passenger autos; (b) promoting projects which minimize quick auto starts and stops, such as live-work development, and office development with ground-floor retail space; (c) separating land uses which are sensitive to pollution from the sources of air pollution; and (d) supporting telecommuting, flexible work hours, and behavioral changes which reduce the percentage of people in Oakland who must drive to work on a daily basis; and

Policy CO-12.3: Expand existing transportation systems management and transportation demand management strategies which reduce congestion, vehicle idling, and travel in single-passenger autos.

4.12.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on traffic and transportation would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the *CEQA Guidelines* and the UC CEQA Handbook:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections), as follows:
  - Cause levels of service at an intersection to degrade below LOS D, based on total intersection delay or on minor street delay for two-way stop-controlled intersections (2000 Highway Capacity Manual methodology); or
  - Cause levels of service at an intersection to degrade from LOS E to LOS F, based on total intersection delay or on minor street delay for two-way stop-controlled intersections (2000 Highway Capacity Manual methodology); or
  - Cause a significant incremental decline in service at an intersection operating, without the addition of project traffic, at LOS E or worse (defined for purposes of analysis as an increase in total traffic volume of 5 percent or more, relative to the No Project volume);[3]
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for its biennial monitoring of Congestion Management Plan (CMP)-designated roads or highways, as follows:
  - On CMP-designated roadway segments that are projected to meet the CMP standard in the future without the project, the impact would be significant if the project would cause the segment to exceed the standard and add at least 5 percent to the future peak hour volume; or
  - On CMP-designated roadway segments that are projected to exceed the CMP standard in the future without the project, the impact would be significant if the project would add at least 5 percent to the future peak hour volume.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses;
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or

[3] The 5 percent threshold is based on the fact that day-to-day traffic volumes can fluctuate by as much as 10 percent (i.e., ± 5 percent), and therefore a variation of 5 percent is unlikely to be perceptible to the average motorist. This is a commonly used threshold in the City of Berkeley and other jurisdictions.

- Conflict with applicable policies, plans, or programs supporting alternative transportation or generate new transit demand that cannot be served by the expected future transit service, including improvements planned by UC and non-UC transit agencies (BART, AC Transit, LBNL shuttles).

Issues Not Discussed Further

The Helios Initial Study found less than significant impacts to air traffic patterns. The project would not affect the air traffic patterns at any of the regional airports. The project does not include activities or structures that could hinder aviation activity. This issue is not discussed further in this section.

Impact Assessment Methodology

This section presents the methodology and assumptions used to analyze traffic impacts of the project. A near-term conditions analysis, which also accounts for other likely near-term developments in the study area, is presented to determine if the project would have any near-term impacts on the surrounding transportation network. For long-term cumulative impacts of the proposed project, (see **Section 5.0, Cumulative Impacts)**.

Project Description

The Helios project, located in the eastern portion of the LBNL site, would contain about 160,000 gross square feet of space. The project is estimated to increase the Adjusted Daily Population (ADP) by 500 persons. Although some of these employees are currently at other LBNL buildings and would relocate to the new building, this analysis assumes that the 500 ADP at the Helios site would be new to the main hill site to account for potential back-fill of existing spaces and present a conservative analysis.

The Helios project would also include a 250-seat auditorium that could attract up to 125 additional non-LBNL persons to the project site during full capacity events. Full capacity use of the auditorium is expected about once a week and most special events would typically take place during weekday afternoons. The majority of non-LBNL event attendees are expected to come from the UC Berkeley campus, and would use the shuttle to travel to the site. If an event is planned at the auditorium that would be open to the public, special shuttle buses would be provided.

The Helios project would construct 50 additional parking spaces. The new parking spaces would be accessed via a new two-lane roadway connecting to Centennial Drive. Although this roadway is still in early design stages, it would be access controlled and not connect to the rest of the LBNL hill site.

Project Trip Generation

The LBNL 2006 LRDP EIR assumed that vehicle trips generated by the growth under the 2006 LRDP would be proportional to the estimated population increase. The LBNL 2006 LRDP also assumed that parking supply would increase in the same proportion. However, vehicle trip generation is also expected to be directly proportional to overall parking supply because the main hill site is somewhat isolated, parking supply in the vicinity of the site is limited, and parking demand at the site is controlled by the number of parking permits issued by LBNL.

Based on information provided in the LBNL 2006 LRDP EIR, LBNL provides one parking space per 1.7 ADP. As stated above, the Helios project would add 50 parking spaces. The Helios project, combined with the Computational Research and Theory (CRT) project (which would be developed simultaneously with the Helios project) would increase LBNL parking supply by 50 spaces while increasing population by 803 ADP. The Helios and CRT projects would need to provide 461 parking spaces to maintain the existing parking supply ratio.

Considering the practical capacity of the site, there are currently about 190 parking spaces available throughout the LBNL hill site. Combined with the 50 spaces that would be added by the Helios project, 240 parking spaces would be available for the Helios and CRT projects. This is about 52 percent of the 461 parking spaces that would be needed by these two projects. Based on the limited parking supply available, the trip generation rate for the project is estimated to be 52 percent of the trip generation rate used in the LBNL 2006 LRDP EIR. The *Trip Generation for Helios and CRT Memorandum*, dated September 17, 2007 and included in **Appendix 4.12**, describes the assumptions and methodology used to estimate vehicle trip generation for the project. This analysis assumes that new vehicle trips would be directly proportional to the parking spaces available for the two projects, and individuals who are not provided parking permits for the available spaces would travel to the site by shuttle buses or other alternate modes of travel. These assumptions are reasonable given the absence of on-street parking in the vicinity of the LBNL site, the fact that permits are needed to park in UC Berkeley parking facilities, and the distance individuals would have to walk in order to access their work sites at LBNL, were they to park off site.

Table 4.12-4, Project Vehicle Trip Generation, presents the resulting estimated trip generation for the Helios project. The project is estimated to generate 353 daily, 38 AM peak hour, and 40 PM peak hour trips. As previously mentioned, the Helios project is expected to be developed simultaneously with the CRT project. As shown in **Table 4.12-4**, the two projects combined would account for 35 percent of the estimated trip generation for the entire LRDP program.

As required by LRDP Mitigation Measure TRANS-1d, LBNL will enhance the current Transportation Demand Management (TDM) program by expanding existing measures, such as increasing the current shuttle service, and developing new measures. These measures would discourage the use of single-occupant vehicles and encourage the use of other commute modes. Since the number of vehicle trips generated by the Helios project would be limited by the available parking supply, the TDM program is expected to be expanded as needed to reduce parking demand and meet the additional demand for alternative commute modes generated by the Helios project.

Trips associated with the use of the 250-seat Helios auditorium are not expected to be high because, as discussed in **Section 3.0, Project Description**, half of the auditorium users at full capacity are expected to be at the Helios site on a daily basis and therefore only an estimated 125 persons would travel to the site when a full capacity event is held in the auditorium. The majority of non-LBNL event attendees are expected to come from the UC Berkeley campus. Due to limited parking supply, many of these attendees are expected to use the Berkeley Lab shuttle. Furthermore, many events will not require travel during peak hours. If an event is planned at the Helios auditorium that would be open to the public, special shuttle buses would be provided. Therefore further evaluation of auditorium-related traffic is not required.

Table 4.12-4
Project Vehicle Trip Generation

Scenario	Adjusted Daily Population	Trip Generation						
			AM Peak Hour			PM Peak Hour		
		Daily	In	Out	Total	In	Out	Total
Existing (2003)	4,000	5,700	540	70	610	75	585	660
LRDP	1,150[1]	1,600	150	20	170	20	160	180
Helios	500	362	34	4	38	5	36	41
Percent of LRDP	43%	22%	22%	22%	22%	22%	22%	22%
Helios and CRT	803	582	55	7	62	8	58	66
Percent of LRDP	75%	36%	36%	36%	36%	36%	36%	36%

Source: Fehr & Peers, 2007 and data presented in section IV.L of the LBNL 2006 LRDP EIR.

[1] The LRDP program has been reduced to 1,000 new ADP in 2025. However, the traffic analysis in the LBNL 2006 LRDP EIR was completed for 1,150 new ADP.

Near-Term No Project Conditions

Major projects currently under construction or expected to be completed in the next few years (through 2012) would add to the traffic in the study area. The near-term projects included in this analysis are described below:

- ***Underhill Parking Structure***, recently completed by UC Berkeley, would provide 690 net new parking spaces in the Southside area.[4]
- ***Lower Hearst Parking Structure***, recently completed by UC Berkeley, would provide 100 net new parking spaces in the Northside area.[5]
- ***Southeast Campus Integrated Projects (SCIP)*** would consolidate existing parking spaces and provide 300 additional parking spaces in the southeast area of UC Berkeley campus. About 900 parking spaces would be provided at the Maxwell Family Field Parking Structure located at Stadium Rim Way, just east of Gayley Road.
- ***Computational Research and Theory (CRT) Facility Project***, located on the west end of the LBNL site, would increase LBNL population by 303 persons.

Other planned LBNL projects such as the User Support Building and Guest House would not result in an increase in the Berkeley Lab's daily population. Thus, they are not expected to add additional traffic to the roadway network.

Other projects, such as the Telegraph Avenue Bus Rapid Transit (BRT) and the Southside Area Plan are proposed for the project area. The BRT project would provide bus service on dedicated travel lanes on Telegraph Avenue between Berkeley and San Leandro. The EIR for the Telegraph Avenue BRT was released in May 2007. The BRT alignment has not been finalized and the project does not have full funding nor has it been approved by AC Transit or other jurisdictions that it would travel through such as cities of Oakland or Berkeley.

The proposed Southside Area Plan would guide development in the Southside neighborhood. As part of the Southside Area Plan, modifications to the transportation circulation network are also under

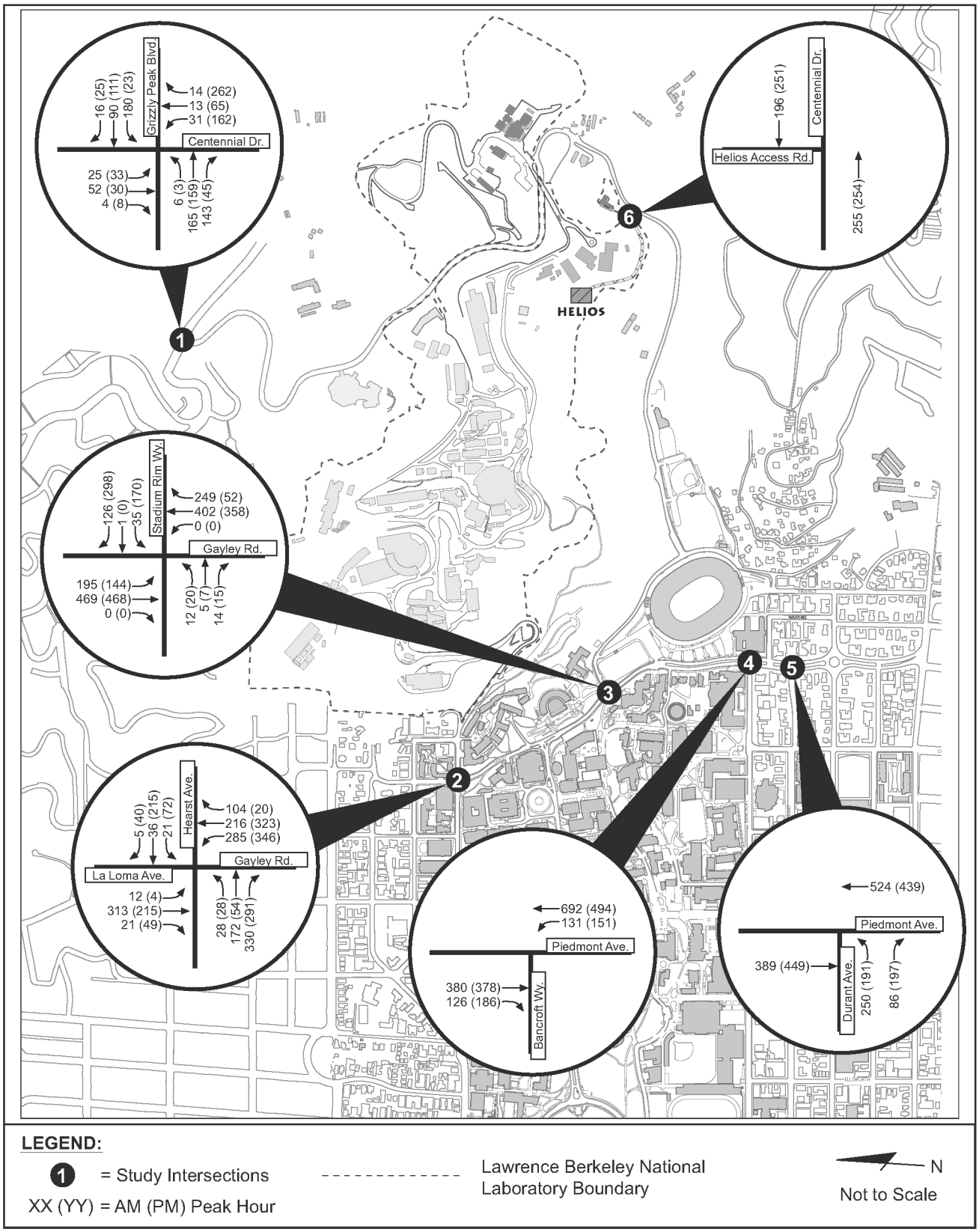
4 The Underhill Parking Structure, although operational at the time of EIR preparation, is included in the near-term analysis as a new project because at the time that traffic counts were conducted that are used in this EIR, the parking structure was not fully operational and had only 310 parking spaces. Following construction, the parking structure now provides approximately 1,000 parking spaces. Since the Existing conditions traffic volumes include traffic associated with the 310 parking spaces that were at the parking structure site in 2002, the net new parking spaces are accounted for in the near-term analysis.

5 Although the Lower Hearst Parking Structure was operational at the time of EIR preparation, it is included in the near-term analysis as a new project because at the time that traffic counts were conducted that are used in this EIR, the parking structure had 100 fewer spaces. The 100 net new parking spaces in this parking facility are accounted for in the near-term analysis.

consideration. These modifications include options such as converting Bancroft Way and Durant Avenue to two-way streets, or restricting vehicular traffic on portions of Telegraph Avenue. The City of Berkeley has not approved the Southside Area Plan or any of the potential modifications to the roadway network. Since neither the BRT project nor the Southside Area Plan has been approved yet, this EIR does not account for potential modifications caused by these proposed but not approved improvements.

Estimated traffic generated by the near-term projects was added to the existing conditions volumes to estimate intersection volumes under near-term No Project conditions. **Figure 4.12-4** presents the AM and PM peak hour intersection volumes under near-term No Project conditions. **Table 4.12-5, Near-Term Conditions – Study Intersection LOS Summary,** summarizes the near-term No Project conditions weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in **Appendix 4.12**. As shown in the table, three of the study intersections that currently operate at LOS D or better, would continue to operate at LOS D or better during both AM and PM peak hours. The all-way stop-controlled Stadium Rim Way/Gayley Road would degrade from LOS D under Existing conditions to LOS F under near-term No Project conditions during both AM and PM peak hours. The all-way stop-controlled Bancroft Way/Piedmont Avenue would continue to operate at LOS F during both AM and PM peak hours primarily due to the high pedestrian volume.[6]

6 As required by the UC Berkeley 2020 LRDP EIR Mitigation Measures TRANS-6a and Trans-7, full signal warrant analysis was completed at the Durant Avenue/Piedmont Avenue and Bancroft Way/Piedmont Avenue intersections based on data collected in April 2007. The study results were submitted to the City of Berkeley in Summer 2007.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-4**

Near-Term No Project Conditions Peak Hour Traffic Volumes

Table 4.12-5
Near-Term Conditions – Study Intersection LOS Summary

Intersection	Control	Peak Hour	Near-Term No Project		Near-Term With Project	
			Delay (Seconds)[1]	LOS [1]	Delay (Seconds) [1]	LOS [1]
Centennial Drive/ Grizzly Peak Boulevard	All-Way Stop-Controlled	AM PM	10.3 18.7	B C	10.4 19.7	B C
Hearst Avenue/Gayley Road/La Loma Avenue	Signalized	AM PM	28.6 37.8	C D	29.5 41.0	C D
Stadium Rim Way/ Gayley Road	All-Way Stop-Controlled	AM PM	**>60** **>60**	**F** **F**	**>60** **>60**	**F** **F**
Bancroft Way/ Piedmont Avenue [2]	All-Way Stop-Controlled	AM PM	**>50** **>60**	**F** **F**	**>60** **>60**	**F** **F**
Durant Avenue/ Piedmont Avenue	All-Way Stop-Controlled	AM PM	26.1 20.7	D C	27.2 20.9	D C
Centennial Drive/ Helios Access Road	Side-Street Stop-Controlled	AM PM	N/A	N/A	9.9 (SB) 10.6 (SB)	A B

Source: Fehr & Peers, August 2007.

N/A = intersection does not exist under this scenario; SB = Southbound.

[1] *Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle for the intersection, and side-street stop-controlled intersection delay and LOS based on average control delay per vehicle for the worst approach, according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.*

[2] *Based on the 2000 HCM methodology, the intersection would operate at LOS F during the AM peak hour and LOS D during the PM peak hour under near-term No Project and near-term With Project conditions. Based on field observations and measurements, the intersection currently operates at LOS F during both AM and PM peak hours due to the high number of pedestrian crossings, which the 2000 HCM methodology does not account for. Thus, the intersection would continue to operate at LOS F during both AM and PM peak hours under near-term No Project and near-term With Project conditions.*

Bold *indicated an intersection operating at unacceptable LOS E or LOS F.*

Mitigation Measures included in the Proposed Project

The following mitigation measures, adopted as part of the 2006 LRDP, are required by the 2006 LRDP for the proposed project and are thus included as part of the proposed project. The analysis presented below evaluates environmental impacts that would result from project implementation following the application of these mitigation measures. These mitigation measures that are included in the project would be monitored pursuant to the Mitigation Monitoring and Reporting Plan that will be adopted for the proposed project.

LRDP MM TRANS-1a: LBNL shall work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection, when a signal warrant analysis shows that the signal is needed. The intersection would meet one-hour signal warrants for peak-hour volume and peak-hour

delay under 2025 conditions with implementation of the LBNL 2006 LRDP. LBNL shall contribute funding on a fairshare basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.

LRDP MM TRANS—1b: LBNL shall work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed. LBNL shall contribute funding, on a fairshare basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.

LRDP MM TRANS-1c: LBNL shall fund and conduct a study to evaluate whether there may be feasible mitigation (with design standards acceptable to the City) at the intersection of Hearst Avenue at Gayley Road/La Loma Avenue. This intersection is currently signalized, and physical geometric limitations constrain improvements within its current right-of-way. All four corners of this intersection are occupied by existing UC Berkeley facilities, including Foothill Student Housing, Cory Hall, and outdoor tennis courts, as well as the Founders' Rock. The LOS analyses herein used conservative assumptions so as to not underestimate potential project impacts. For example, even though the approach widths at this intersection allow drivers to maneuver past other vehicles as they near the intersection, the absence of pavement striping to delineate separate lanes dictated that the analysis conservatively assume all vehicle movements on each approach are made on

a single lane. Similarly, without the certainty that standard lane widths (and adequate storage lengths) could be provided, possible improvement measures were not relied on to judge that significant impacts would be mitigated to less than significant levels. Judging the success of possible mitigation measures with a conservative standard is reasonable, but in consultation with City of Berkeley staff, the Lab will conduct a further study to re evaluate whether there may be feasible mitigation (with design standards acceptable to the City) at this intersection. That additional study will be conducted by the Lab as part of the TDM program set forth below as Mitigation Measure TRANS-1d. If such mitigation is determined by Berkeley Lab to be feasible, then Berkeley Lab shall contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for the installation of the improvements.

LRDP MM TRANS-1d: LBNL shall develop and implement a new TDM Program to replace its existing TDM program. This enhanced TDM Program has been drafted in consultation with the City of Berkeley, and is proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The proposed TDM Program includes several implementation phases tied to the addition of parking to LBNL. The final provisions of the TDM Program may be revised as it is finally adopted but will include a TDM coordinator and transportation committee, an annual inventory of parking spaces and a gate count, a study of more aggressive TDM measures, investigation of a possible parking fee, investigation of sharing services with UC Berkeley and an alternative fuels program. The TDM program shall also include funding of a study to reevaluate the feasibility of mitigation at the Hearst and Gayley/LaLoma intersection. The new draft proposed TDM Program also includes a requirement that LBNL conduct an additional traffic study to reevaluate traffic impacts on the earliest to occur of 10 years following the certification of this EIR or the time at which the Lab formally proposes a project that will bring total development of parking spaces pursuant to the 2006 LRDP to or above 375 additional parking spaces.

LRDP MM TRANS-3: LBNL shall develop and maintain a transportation plan designed to ensure that the current balance of transportation modes is maintained. This plan shall include 1) maintaining the same (or lesser) ratio of parking permits and

parking spaces to adjusted daily population (ADP), and 2) ensuring that levels of shuttle bus service and provision of bike racks on shuttle buses are sufficient to accommodate projected demand.

LRDP BP TRANS-6a: Early in construction period planning, LNBL shall meet with the contractor for each construction project to describe and establish best practices for reducing construction period impacts on circulation and parking in the vicinity of the project site. The Lab will work with the City of Berkeley Transportation and Public Works Departments to review the truck routes and the Construction Traffic Management Plans, as appropriate. Where construction traffic could interact with traffic from construction traffic from UC Berkeley, UC Berkeley staff would be invited to participate in these discussions between LBNL and the City.

LRDP BP TRANS-6b: For each construction project, LBNL shall require the prime contractor to prepare a Construction Traffic Management Plan that will include, but will not necessarily be limited to, the following elements:

- Proposed truck routes to be used, consistent with the City truck route map.
- Construction hours, including limits on the number of truck trips during the AM and PM peak traffic periods (7:00 to 9:00 AM and 4:00 to 6:00 PM), if conditions demonstrate the need.
- A parking management plan for ensuring that construction worker parking results in minimal disruption to surrounding uses.

LRDP BP TRANS-6c: LNBL shall manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.

LRDP MM TRANS-8: LBNL shall implement LRDP MM TRANS-1a (work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection; LBNL would contribute funding on a fair share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal) and LRDP MM TRANS-1b (work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed; LBNL would contribute funding on a fair-

share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal and for monitoring to determine when a signal is warranted).

Project Impacts and Mitigation Measures

Potential project impacts on transportation and traffic are discussed in this section. The LBNL 2006 LRDP EIR found no significant impacts on the Congestion Management Plan (CMP) roadway system. Since the Helios project would generate fewer vehicle trips than the 2006 LRDP program and would not modify the regional roadway system, it would not exceed the LOS standards established for the CMP roadway system; thus this impact of the Helios project would be less than significant and is not evaluated further in this EIR.

Helios Impact TRANS-1: The proposed Helios project would not cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system under the near-term conditions. (*Less than Significant*)

The estimated vehicle trips generated by the Helios project as described in the previous section were added to the near-term No Project AM and PM peak hour intersection volumes. The resulting near-term With Project conditions intersection volumes are shown on **Figure 4.12-5, Near-Term With Project Conditions Peak Hour Traffic Volumes.**

Table 4.12-5 summarizes the near-term With Project conditions weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in **Appendix 4.12.** As shown in the table, all five of the existing study intersections would continue to operate at the same LOS as in the near-term No Project conditions. The new side-street stop-controlled Centennial Drive/Helios Access Road intersection would operate at LOS A during the AM peak hour and LOS B during the PM peak hour.

The Stadium Rim Way/Gayley Road and Bancroft Way/Gayley Road intersections would continue to operate at LOS F during both AM and PM peak hours. However, the proposed Helios project would increase intersection volumes by less than five percent at these two intersections. Thus, the project would not cause a significant impact at these two intersections.

Mitigation Measure: No project-level mitigation measure required.

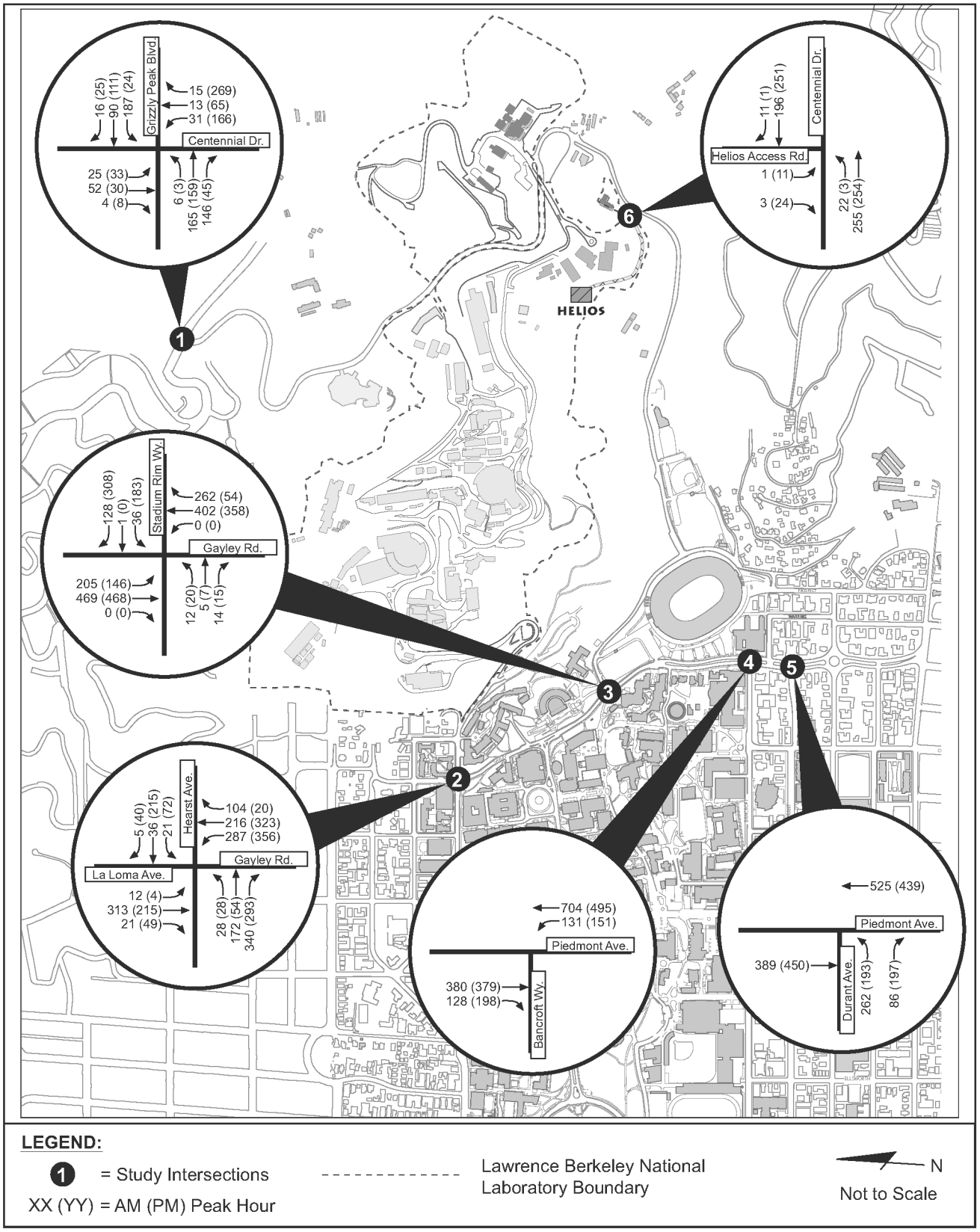
Helios Impact TRANS-2: The design of the proposed Helios parking area and access road would not result in inefficient and unsafe operations. (*Less than Significant*)

Vehicles and pedestrians would access the Helios Facility from the existing LBNL site through a driveway connection to an existing service road that in turn connects to Lawrence Road. Truck loading would be provided at the northern end of the building, and therefore delivery trucks would access the site from the existing LBNL roadways through the driveway connection with the service road and Lawrence Road.

Access to the western and lower portion of the proposed building would be provided by a new roadway, referred to as Helios Access Road that would be connected to Centennial Road. This new roadway would not connect with the existing LBNL internal roadway system and would terminate at the proposed building. A parking area with 50 spaces would be constructed along the east side of the new roadway near the proposed building. The new Helios Access Road would be used by both site employees and visitors and would be card-access controlled through a gate about 50 feet from Centennial Drive. The new roadway would provide two 12-foot lanes and a 4-foot-wide sidewalk along its length. The new Centennial Drive/Helios Access Road intersection would be controlled by a stop-sign on the Helios Access Road. The design of the Helios Access Road and the intersection of the Helios Access Road with Centennial Road are in the early phases. Four options are under consideration for the alignment and configuration of the intersection that were evaluated to determine whether the intersection would allow vehicles, including fire engines, to move safely between Centennial Drive and the Helios Access Road.

The Caltrans *Highway Design Manual* (HDM) requires that adequate stopping sight distance and corner sight distance be provided at intersections on public roads. Assuming a design speed of 35 miles per hour (mph) on Centennial Drive and accounting for the sustained grades on Centennial Drive, HDM would require a minimum stopping sight distance of 300 feet and corner sight distance of 460 feet for driveways on Centennial Drive. However, HDM also allows corner sight distance to be reduced to the minimum stopping sight distance where restrictive conditions exist (Section 405.1(2)(a)). Restrictive conditions are defined as locations where the cost to obtain the corner sight distance may be excessive due to right-of-way acquisition, building removal, extensive excavation, or unmitigable environmental impacts.

The four design options for the Centennial Drive/Helios Access Road intersection would provide adequate stopping sight distance in both directions of Centennial Drive. Although none of the options would provide the minimum corner sight distance without extensive grading, the minimum stopping sight distance would be adequate. Thus, all four intersection design options would provide adequate sight distance for vehicles turning into and out of the Helios Access Road in both directions of Centennial Drive.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-5**

Near-Term With Project Conditions Peak Hour Traffic Volumes

In addition, the four design options for the Helios Access Road would provide adequate space for a standard fire engine (about 48-foot-long non-articulated) to turn into and out of the intersection. Therefore the impact on vehicle safety would be less than significant. To ensure that the final design of the roadway and intersection continues to meet the safety standards, the following mitigation measure is proposed for this less than significant impact.

Helios Mitigation Measure TRANS-2: Final design shall incorporate the following measures to improve the efficiency and ensure the safety of vehicles, bicyclists, and pedestrians:

- Design the Centennial Drive/Helios Access Road intersection to provide adequate sight distance for a design speed of 35 miles per hour to allow vehicles to safely turn into and out of the new Helios Access Road. Trim foliage near the intersection on a regular basis to maintain adequate sight distance.
- Locate the gate on the new roadway to provide adequate sight distance for vehicles approaching the gate.
- Provide turn-around area prior to the gate to allow vehicles that enter the access roadway by error to turn around.
- Design the new Centennial Drive/Helios Access Road intersection, roadway, and parking area to accommodate shuttle bus circulation.

Helios Impact TRANS-3: The proposed Helios project would result in increases in transit ridership. (*Less than Significant*)

As previously discussed, the Helios project would generate proportionally fewer vehicle trips than estimated in the LBNL 2006 LRDP EIR due to the limited parking supply. Thus, some employees and visitors to the site are expected to shift to transit modes (i.e., AC Transit, BART, LBNL shuttle) to commute to and from LBNL.

One of the principles of the LBNL 2006 LRDP is to encourage a higher transit mode share. LRDP Mitigation Measure TRANS-1d would implement a TDM program which includes specific measures and strategies to encourage and accommodate higher transit use. Thus, the incremental increase in transit demand generated by the Helios project is consistent with the LRDP principle to encourage higher transit use and the expanded TDM program is expected to encourage and accommodate the higher transit use.

The LBNL shuttles operating on-site would provide transit service to the project site through existing stops on Lawrence Road near the Molecular Foundry building and on Lee Road near Buildings 62 and 66. The BEAR Transit Line H, which currently operates along Centennial Drive, would be expanded to provide an additional stop in front of the lower entrance of the Helios Facility on the new access road

connecting to Centennial Drive. The expanded shuttle service would connect the Helios Facility with UC Berkeley and downtown Berkeley. The expansion of the shuttle service is consistent with the 2006 LRDP strategy to improve the LBNL shuttle service. It is expected that shuttle ridership and travel times would be monitored as part of the proposed TDM program, and if necessary, shuttle service would be modified to meet the expected demand.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact TRANS-4: The proposed Helios project would result in increased parking demand that may exceed the available parking supply. *(Potentially Significant, Less than Significant with Mitigation)*

The LBNL 2006 LRDP anticipated that parking supply would increase at the same rate as population increase. Currently, LBNL provides one parking space per 1.7 ADP. Thus, the proposed 500 ADP Helios project would require 287 parking spaces. However, the proposed Helios project would increase the parking supply by 50 parking spaces. Therefore, only a portion of the parking demand generated by the Helios project would be accommodated by the Helios parking area.

Considering the practical parking capacity of LBNL, the site currently has about 190 parking spaces available. Combined with the 50 parking spaces in the Helios parking area, about 240 parking spaces would be available at LBNL for use by Helios project. The expected supply is less than the estimated increase in parking demand due to the Helios project, and would be even lower if parking demand of the CRT project is also factored in. The proposed TDM program (LRDP Mitigation Measure TRANS-1d) is intended to enhance alternative travel modes to LBNL and reduce parking demand for the site. LBNL will implement LRDP Mitigation Measure TRANS-1d to address potential parking shortfalls with the proposed Helios project. Specifically, the Berkeley Lab will monitor parking demand and if peak parking demand approaches practical parking capacity, it will limit the number of parking permits issued and explore charging a fee for parking.

Full-capacity events at the Helios auditorium could attract up to an additional 125 people to the site about once a week. As discussed above under Helios Impact TRANS-3, most of the off-site attendees are expected to come from UC Berkeley and are expected to use alternative modes to access the site. Therefore additional demand for parking would not be created as a result of the routine use of the auditorium, even for full-capacity events. Occasionally, there could be special events in the Helios auditorium that would be open to the public. If a special event is planned at the auditorium that would be open to the public, special shuttle buses would be provided. However, should some of the event attendees choose to drive the additional parking demand would further exacerbate the potential parking

shortage at LBNL. Therefore, the project's impact related to parking during special events at the auditorium could be potentially significant.

Helios Mitigation Measure TRANS-4: LBNL shall implement the following measures during special events at the Helios auditorium:

- Provide attendant and/or stacked parking for special events. Attendant and/or stacked parking should not be used for regular day-to-day operations as it would be inconsistent with the LBNL principle to discourage driving and encourage alternative travel modes; and
- Include information on availability of alternative transportation modes, such as LBNL shuttles, in announcements of special events at the Helios auditorium.

Significance after Mitigation: With the implementation of the proposed mitigation measure, the impact would be less than significant.

Helios Impact TRANS-5: The proposed Helios project would not result in increased hazards to pedestrians or bicyclists or conflicts with adopted policies, plans, or programs promoting walking or bicycling. (*Less than Significant*)

Since the proposed Helios project would provide fewer parking spaces than planned for in the LBNL 2006 LRDP, more employees and visitors would be encouraged to bicycle or walk to the site. The new Helios Access Road would be open to bicyclists and provide a sidewalk along the east side of the roadway for pedestrians to walk between Helios Facility and Centennial Drive. Centennial Drive has been identified as a future Class 3 facility (signed bike route) by the City of Berkeley, and an unpaved path is provided on the south side of Centennial Drive. These facilities can be used by bicyclists and pedestrians to access the site from Centennial Drive. However, extensive use of these facilities is not expected due to the steep grades along Centennial Drive. The Helios project would also provide 36 bicycle parking spaces, and showers and lockers that would further encourage bicycling and walking to the site.

The proposed Helios project would not result in increased hazards to pedestrians or bicyclists or conflicts with adopted policies, plans, or programs promoting walking or bicycling. This would be a less than significant impact.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact TRANS-6: The construction of the proposed Helios project would temporarily and intermittently result in impacts on vehicles, pedestrians, or bicyclists, and parking. (*Less than Significant*)

Construction of the Helios project is expected to start in spring 2008 and be completed by summer 2010. Construction could result in temporary impacts from truck traffic, material staging, construction worker commute trips, and parking. LBNL BP TRANS 6a through 6c (which are continuing best practices that have been adopted by the Berkeley Lab in conjunction with the approval of the 2006 LRDP) require the contractor to meet with LBNL and prepare a Construction Traffic Management Plan (CTMP) to lessen the impacts of construction on traffic and parking. The CTMP must propose truck routes, limit truck traffic during peak commute period (7:00 to 9:00 AM and 4:00 to 6:00 PM), and prepare a parking management plan for construction workers. Consistent with LBNL BP TRANS -6a and BP TRANS -6b, a CTMP would be prepared and implemented during project construction.

About 20,000 cubic yard (CY) of fill material would be needed in the early stages of construction. Currently, LBNL has about 10,000 CY of fill material stored in an on-site borrow area in the northeastern portion of the LBNL site. Therefore, at least half of the fill material would be hauled within LBNL and the rest would be imported. Assuming that each truck has a 12 CY capacity, the delivery of fill material for Helios project would result in up to 1,666 one-way truck trips (833 inbound full trucks and 833 outbound empty trucks), using city streets. The fill stage of the construction, expected to last about three months, would generate up to 28 one-way truck trips per day using City streets.

Following completion of site grading activities, the construction of the Helios project is expected to require about 10 major truck deliveries per day, resulting in 20 one-way truck trips that would use city streets. All construction trucks are expected to travel to and from the site via the new Helios Access Road and Centennial Drive. Thus, during the fill phase of the construction, 28 trucks would use city streets on a typical day, whereas for the rest of the duration of project construction about 20 large trucks would use city streets on a typical day. In compliance with the 2006 LRDP, the proposed project will implement LRDP BP TRANS-6a, 6b, and 6c to minimize construction traffic impacts on city streets. LBNL BP TRANS-6a requires the Berkeley Lab to work with the City of Berkeley to review truck routes and CTMP. LBNL BP TRANS 6b limits truck traffic during the peak commute periods (7:00 to 9:00 AM and 4:00 to 6:00 PM) and requires the use of designated truck routes. Pursuant to LRDP BP TRANS-6c, the Berkeley Lab will manage project schedules to minimize overlap of heavy truck activity periods of its ongoing projects. The project's impact related to construction truck traffic would be less than significant. To further minimize impacts related to construction activities, the following mitigation measure will also be implemented.

Helios Mitigation Measure TRANS-6: LBNL shall include the following in the CTMP prepared for the proposed project:

- Consider stacked parking within the LBNL site or off-site parking for construction workers to minimize parking demand.
- If necessary, require a flag person to direct traffic when trucks enter and exit the Helios Access Road on Centennial Drive.

4.12.5 References

AC Transit's website, accessed August, 2007. http://www.actransit.org.

Bay Area Rapid Transit District. 2007.

Caltrans, 2007. Highway Design Manual. January.

City of Berkeley. 2005. Berkeley Bicycle Plan Update. February.

LBNL Shuttle website, accessed August 2007.

Lawrence Berkeley National Laboratory. 2007. 2006 Long Range Development Plan Final Environmental Impact Report, SCH No. 2000102046, July.

Transportation Research Board. 2000. Highway Capacity Manual – Special Report 209.

UC Berkeley Public Safety and Transportation website, accessed August 2007. http://www.tsc. berkeley.edu

University of California. 2006. Campus Bicycle Plan. August.

4.13 UTILITIES AND SERVICE SYSTEMS

4.13.1 Introduction

This section presents existing utilities and service systems at the project site and analyzes the potential for implementation of the proposed Helios project to affect those systems. Information presented in the discussion and analysis below was obtained from site visits, the Lawrence Berkeley National Laboratory (LBNL) 2006 Long Range Development Plan (LRDP) Environmental Impact Report (EIR), and environmental documents associated with specific LBNL projects.

In response to the Notice of Preparation (NOP) circulated for this EIR, the East Bay Municipal Utility District (EBMUD) commented that because sanitary sewer capacity is constrained through the city of Berkeley during the wet season, the utilities analysis must include additional information regarding the project's contribution to the constrained line and appropriate mitigation measures. Additionally, EBMUD indicated that it proposes to build a new water storage tank near the project site and that the cumulative impact of that project should be considered in the Helios project EIR. The potential impact of the proposed project on the constrained sewer line is evaluated in this section. The cumulative impacts of constructing a water storage tank in the project vicinity are discussed in **Section 5.0, Cumulative Impacts**, of this EIR.

4.13.2 Environmental Setting

The Initial Study prepared to define the scope of this EIR concluded that the proposed project would result in a less than significant impact related to water supply, solid waste capacity and regulations, and telecommunication facilities. These utilities and service systems are not discussed further in this EIR, and the discussion of environmental setting below focuses on wastewater, storm water, chilled water, electricity, and natural gas.

Wastewater

EBMUD provides wastewater treatment services to parts of Alameda and Contra Costa counties along the east shore of the San Francisco Bay, including the project site. Wastewater from LBNL is collected and conveyed via the city of Berkeley's public sewer system and EBMUD-operated interceptor sewers to the regional wastewater treatment facility located southwest of the Interstate 80 (I-80) and Interstate 580 (I-580) interchange in Oakland.

Currently, EBMUD's wastewater treatment facility has an average annual daily flow of 80 million gallons per day (mgd) (EBMUD 2007). During wet weather, the treatment plant accepts more flow. The plant

has a primary treatment capacity of 320 mgd and a maximum secondary treatment capacity of 168 mgd. After treatment, wastewater is discharged into the San Francisco Bay via a 1-mile-long deep-water outfall line.

LBNL On-Site Wastewater Collection System

Wastewater at the Berkeley Lab is carried via a gravity flow system, owned and operated by LBNL. This system eventually discharges to the city of Berkeley's public sewer system through two monitoring stations, one located at Hearst Avenue (Hearst Monitoring Station) and the other at Centennial Drive in Strawberry Canyon (Strawberry Monitoring Station). The monitoring stations measure the volume of the effluent on a continuous basis. In addition, samples of the effluent are taken at regular intervals and evaluated for radioactivity and other constituents mandated by EBMUD.

The effluent from the eastern portion of the Berkeley Lab, including effluent from uses near the project site, flows from the Strawberry Monitoring Station through a University of California Berkeley (UC Berkeley) sewer line, which ties into the city of Berkeley's system at a manhole near the intersection of Stadium Rim Road and Canyon Road.

Wastewater Generation

Annual wastewater generation at LBNL is approximately 38 million gallons, with personal wastewater accounting for approximately half and process water from research areas accounting for the other half. While sewer flows vary widely according to the time of day and time of year, the Berkeley Lab's approximate peak daily flow is about 274,000 gallons per day (gpd) during dry weather conditions and 821,000 gpd during peak wet weather conditions (LBNL 2007). At the Hearst Monitoring Station, the average wastewater flow is about 50,000 gpd and can range from 30,000 to 100,000 gpd. At the Strawberry Monitoring Station, LBNL's approximate average daily flow is 100,000 gpd and can range from 50,000 to 170,000 gpd (Pauer 2007). These ranges represent averages throughout the year. The effluent flow at the Strawberry Monitoring Station also includes wastewater from the UC Berkeley Hill Campus area buildings, which contribute about half of the amount measured.

Sewer System Conditions and Upgrades

The main concern with sanitary sewer flow near the project site and region-wide in the EBMUD system is the infiltration and inflow (known as "infiltration/inflow" or "I/I") of storm water into the sanitary sewer lines attributed to the poor condition of aging sewer pipes. LBNL has acted to address I/I problems in its system through a concerted sewer infrastructure upgrade program. A plumbing maintenance and upgrade effort has been undertaken during the past 15 years by LBNL, along with installation of water-

saving devices and systems, to substantially lower average sewer flows. These ongoing efforts have reduced both peak wet weather as well as average sewer flows by well over half. Moreover, LBNL's peak wet weather I/I rate is less than half that of the city of Berkeley and it is only approximately 10 percent of that found in the EBMUD service district on average (LBNL 2007). LBNL continues to seek ways to reduce both water consumption and sewage generation.

LBNL currently pays EBMUD for assessed sewer services. The University has also contributed to the city of Berkeley's sewer upgrade program, which is intended to increase wet weather flow capacity and decrease I/I conditions. The city of Berkeley's I/I correction program was initiated in 1987 and includes rehabilitation or replacement of 50 percent of the city's existing system over 30 years, as well as installation of 12 miles of new sewer lines to accommodate overflow conditions by the year 2007. By 1999, over 25 percent of the planned replacement and rehabilitation had been completed and 10 miles of the proposed 12 miles of new sewer lines had been installed. An interceptor line along Adeline Street, completed in 1992, conveys wet weather flow to EBMUD's storage and treatment facilities. The city's I/I correction program allows for a 20 percent increase in the base wastewater flow due to changes in land use or population (city of Berkeley 2001).

Sanitary sewage from LBNL's eastern portion (and upstream UC Berkeley Hill Campus buildings) generally is routed into pipes exiting the Berkeley Lab at Centennial Drive. The LBNL Centennial Drive sanitary sewer flows into the UC Berkeley sewer on Centennial Drive and then into city of Berkeley's sanitary sewer sub-basin 17-503. This sub-basin also collects wastewater from other sources, including the Panoramic Hill area. From sewer sub-basin 17-503, LBNL's wastewater continues to flow through city sanitary sewer basin 17 to basin 15 and into EBMUD-operated interceptor sewers and its treatment plant.

Sanitary sewer sub-basin 17-503 is constrained around Dwight Avenue during peak wet weather conditions. The problem is cross-jurisdictional, since sub-basin 17-503 receives wastewater flow from both the city of Berkeley and the city of Oakland. Additionally, the sewer pipes cross both the Hayward Fault and numerous landslide areas, making them vulnerable to damage. The constricted portion of sub-basin 17-503 runs beneath Prospect Road, which is the principal automobile access to a large portion of the Panoramic Hill neighborhood. Rehabilitation of or improvement to this portion of sewer line would be difficult as it would obstruct access, egress, and emergency service to this residential area.

The Berkeley Lab has studied various scenarios to divert Lab and UC Berkeley effluent to other sanitary sewer lines that are not currently constrained. According to the East Canyon Report, there is sufficient capacity both in the Berkeley Lab sanitary sewer system and at the Hearst Monitoring Station to accept additional flows.

Storm Water Drainage

The LBNL storm drain system is a gravity-fed network of open and culverted drainage conveyances, running generally east to west. Drain pipes range from 4-inch diameter to 36-inch diameter and consist of metal, PVC, concrete, and tile pipe. Run-on (i.e., water draining onto the site from off-site locations) enters the LBNL site via open drainage channels and combines with runoff from the LBNL site. The combined drainage is conveyed across developed portions of the Berkeley Lab via underground piping, and is then discharged at established open drainage channels of the Strawberry Creek watershed, into both the north fork of Strawberry Creek to the north and to Strawberry Creek itself to the south. The existing storm water drainage system is designed to handle flows expected in a 100-year storm. An expanded discussion of the existing and proposed on-site storm water drainage system is included in **Section 4.7, Hydrology and Water Quality**, of this EIR.

Chilled Water

LBNL does not maintain a site-wide chilled water distribution system. LBNL buildings that require chilled water are supplied by on-site chillers and cooling towers.

Electricity

Electrical power at the Berkeley Lab is purchased from the Western Area Power Administration and delivered by the Pacific Gas and Electric (PG&E) transmission system to the Berkeley Lab's Grizzly Substation located adjacent to Building 77. PG&E delivers power to LBNL on two overhead 115-kilovolt (kV), 3-phase, 60-Hertz (Hz) transmission lines with a joint capacity of approximately 100 megawatts (MW). Both of these transmission lines feed power from PG&E's El Sobrante switching station to the Grizzly Substation. The Grizzly Substation consists of two United States Department of Energy (DOE) owned 120/12 kV power transformers with a combined capacity of 100 MW. This substation is for the exclusive use of LBNL. In addition, LBNL's power can be supplied from UC Berkeley's Hill Area Substation, located adjacent to the Grizzly Substation.

The main power distribution system at the Berkeley Lab consists of a 12.47-kV underground system with smaller substations and transformers that reduce voltage to 480/277 volts (V) or 208/120 V. The 12.47-kV distribution system has dual primary feeders to provide reliable power. Certain buildings are equipped with special voltage regulation in order to ensure that critical experiments will not be disrupted by transient voltage within the system. Total electrical power consumption at LBNL in 2006 was 71,100 megawatt hours (MWh) (Energy Management System 2007).

LBNL also has a number of stationary and portable emergency power generators. These generators start automatically in the event of a power failure and are used to provide an emergency power supply for certain critical services (e.g., for laboratory exhaust fans, exit lights, the fire station, Radio Communications Facility, and the Health Services Building) and other important activities at LBNL. The generators are powered either by diesel, gasoline, or natural gas. The total generating capacity of these emergency generators is approximately 6,250 kilowatts.

Natural Gas

Natural gas is used at the Berkeley Lab for heating all buildings, equipment, operations, and some experimental uses. The natural gas supply is provided by the Defense Fuel Supply Center in Oregon and delivered by the PG&E system. The LBNL natural gas system receives its supply from a 6-inch PG&E line operating at 50 pounds per square inch gauge (psig). The point of delivery is a meter vault in the hillside area above Cyclotron Road and below Building 88. A 6-inch gas line operating at 13.5 psig distributes high pressure natural gas from PG&E's metering vault to the buildings throughout the Berkeley Lab. Current (2006) natural gas usage is approximately 1.5 million Therms, or about 20,000 British thermal units (Btu) per gross square foot (Energy Management System 2007).

4.13.3 Regulatory Considerations

State Regulations

Planning for energy is regulated at the state level. Specific regulations that would be relevant to implementation of the proposed project are described below.

Title 24

Buildings constructed after June 30, 1977, must comply with standards identified in Title 24 of the California Code of Regulations. Title 24 requires the inclusion of state-of-the-art energy conservation features in building design and construction, including the incorporation of specific energy-conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget. Consistent with UC Policy on Sustainable Practices, the project has been design to exceed Title 24 requirements by at least 20 percent.

Local Plans and Policies

2006 LRDP Principles and Strategies[1]

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The two principles most applicable to utilities-related aspects of new development are to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship" and to "Build a safe, efficient, cost-effective scientific infrastructure capable of long-term support of evolving scientific missions."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. Development strategies set forth in the 2006 LRDP that are applicable to utilities include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas, and mature tree stands by focusing future development primarily within the already developed areas of the site;
- Provide flexibility in the identification of land uses and in the siting of future facilities to accommodate the continually evolving scientific endeavor;
- Increase development densities within areas corresponding to existing clusters of development to preserve open space, and enhance operational efficiencies and access;
- To the extent possible site new projects to replace existing outdated facilities and ensure the best use of limited land resources;
- To the extent possible, site new projects adjacent to existing development where existing utility and access infrastructure may be utilized;
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water, and material consumption and provide improved occupant health, comfort, and productivity;
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory;
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas;

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1 While this Environmental Impact Report presents a "stand alone" impact analysis that does not rely upon tiering from any programmatic CEQA document, Berkeley Lab does actively follow the 2006 Long Range Development Plan (LRDP) as a planning guide for Lab development. Accordingly, relevant 2006 LRDP principles, strategies, and design guidelines are identified in this section.

- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, and reduce erosion and sedimentation;
- Maintain a safe and reliable utility infrastructure capable of sustaining the Laboratory's scientific endeavors;
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways;
- Ensure that utility infrastructure improvements accommodate future facility expansion and alterations in the most cost-effective means possible; and
- Design infrastructure improvements to embody sustainable practices.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the 2006 LRDP and provide specific guidelines for site planning, landscape and building design as a means to implement the 2006 LRDP's development principles as each new project is developed. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to the utilities-related aspects of new development:

- Provide appropriate site lighting for safety and security;
- Segregate public entries and paths from service entries and paths where feasible; and
- Reduce the amount of impermeable surfaces at the Berkeley Lab.

UC Policy on Sustainable Practices

As discussed in **Section 3.0, Project Description**, the proposed project would be consistent with the UC Policy on Sustainable Practices. This policy implements guidelines for new building construction related to energy efficiency and sustainable materials. The goal for new construction is to outperform the requirements of Title 24 energy-efficiency standards by at least 20 percent.

4.13.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on utilities and service systems would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the *CEQA Guidelines* and the UC CEQA Handbook:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or if new or expanded entitlements are needed;
- Result in the need for increased chilled water or steam generation capacity or major distribution improvements;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;
- Not comply with applicable federal, state, and local statutes and regulations related to solid waste;
- Require or result in the construction or expansion of electrical or natural gas facilities which would cause significant environmental impacts; and
- Require or result in the construction or expansion of telecommunication facilities, which would cause significant environmental impacts.

Issues Not Discussed Further

The Helios project Initial Study found less than significant impacts to water supplies, solid waste capacity, solid waste regulations, and telecommunication facilities. Since the expected water demand for the project was accounted for in the water demand estimate for development under 2006 LRDP and thus, in EBMUD's 2020 water demand projection, the project would not result in an increase in water use beyond what EBMUD has projected for the region and would not result in the need for new or expanded water entitlements. The project-related demand for water supply, including water delivery for the purposes of firefighting, would not result in the need for new or upgraded water facilities.

Implementation of the project would not cause any landfill to exceed its permitted capacity and would result in a less than significant impact related to solid waste. The proposed project would not affect telecommunication facilities and no impact would occur. These issues are not discussed further in this section.

Mitigation Measures included in the Proposed Project

The following mitigation measures, adopted as part of the 2006 LRDP, are required by the 2006 LRDP for the proposed project and are thus included as part of the proposed project. The analysis presented below evaluates environmental impacts that would result from project implementation following the application of these mitigation measures. These mitigation measures that are included in the project would be monitored pursuant to the Mitigation Monitoring and Reporting Plan that will be adopted for the proposed project.

LRDP MM UTILS-2: LBNL shall implement programs to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins, as necessary and appropriate. LBNL shall continue to direct the Lab's existing western effluent flows into sub-basin 17-013. In addition, new flows at the Lab shall be directed into either sub-basin 17-013, sub-basin 17-304, unconstrained portions of sub-basin 17-503, or another sub-basin that has adequate capacity. Final design and implementation of these improvements shall be negotiated between the appropriate parties and shall undergo appropriate environmental review and approval. LBNL shall closely coordinate the planning, approval, and implementation of this mitigation measure with the city of Berkeley and UC Berkeley, as appropriate.

LRDP MM UTILS-4: LBNL shall develop a plan for maximizing diversion of construction and demolition materials associated with the construction of the proposed project from landfill disposal.

Project Impacts and Mitigation Measures

Helios Impact UTILS-1: Implementation of the Helios project would not require an expansion of the EBMUD wastewater treatment plant or an expansion of the City's sewer conveyance facilities. (*Less than Significant*)

The proposed project would generate wastewater in the form of wastewater from restrooms and the cafeteria, laboratory wastewater, and cooling tower blowdown. These sources combined would generate on an average approximately 8,500 gpd of wastewater flows and peak day flows of about 12,320 gpd. EBMUD has previously indicated the wastewater treatment plant has sufficient capacity to serve all of the development envisioned under the 2006 LRDP. Therefore, there is sufficient capacity at the wastewater treatment plant to serve the proposed project.

Currently, wastewater from the project area and other flows from UC Berkeley Hill Campus area flow down a sanitary sewer line within Centennial Drive toward the city of Berkeley. Near Dwight Way and Prospect Road, flows from the Panoramic Hill residential area combine with LBNL wastewater flows and create a surcharge during wet weather conditions at the city's sub-basin 17-503. As discussed earlier in this section, the Berkeley Lab has identified several approaches to diverting some existing flows from the Berkeley Lab site and the UC Berkeley Hill Campus Area east toward the Hearst Monitoring Station that has sufficient capacity to accept additional flows.

In compliance with LRDP Mitigation Measure UTILS-2 and as described in **Section 3.0, Project Description**, the Berkeley Lab would implement one of three options for handling wastewater generated by the project that would address the problem of reduced capacity in sub-basin 17-503. Wastewater Option 1 involves diverting wastewater flows away from the Centennial Drive sewer line and into the Hearst Avenue sewer line. This would allows for additional capacity in the Centennial Drive sewer line to receive project-generated wastewater flows as well as other wastewater flows from future growth in the eastern portion of the Berkeley Lab. Wastewater Options 2 and 3 involve diverting wastewater flows into existing UC Berkeley sanitary sewer lines which would be expanded to handle the increased flows. The on-site option for wastewater diversion is shown on **Figure 3.0-7, Wastewater Diversion Option 1,** and the off-site options are shown on **Figure 3.0-8, Wastewater Options 2 and 3**. It is anticipated that approximately 100,000 gpd of flows would be diverted from the Strawberry Monitoring Station under the Wastewater Option 1. Given that the proposed project would contribute on average 8,500 gpd, there would be a net decrease in discharge at the Strawberry Monitoring Station with Wastewater Option 1. It is anticipated that approximately 100,000 gpd of flows would be diverted from the constrained sub-basin 17-503 under either Wastewater Option 2 or 3. The new sanitary sewer lines constructed for either option would be sized appropriately to accommodate these flows, and the upgrades to existing sanitary sewer lines would be sufficient to accommodate the additional flows. Under all options, an expansion of the city of Berkeley sewer lines would not be required. With the implementation of any of the three options, project-related wastewater flows under both normal and wet weather conditions would not exacerbate the capacity constraint in the city's sub-basin 17-503 and would not require any off-site improvements that could result in significant environmental impacts.

With respect to the environmental impacts from the construction of the new sewer pipeline or the sewer pipeline upgrades under the three options, those impacts are addressed in **Section 4.3, Biological Resources**, **Section 4.4, Cultural Resources**, and **Section 4.6, Hazards and Hazardous Materials, and Section 4.9, Noise,** of this EIR. As that analysis shows, environmental impacts from the construction of the new pipeline sections would be less than significant as the construction under Wastewater Option 1 would occur along existing right-of-way areas in the Berkeley Lab. In the case of Wastewater Options 2

and 3, all improvements would also occur within road right-of-way areas and through previously disturbed areas. Furthermore, upsizing of existing sanitary sewer lines would be done within existing right-of-way using the pipe bursting technology, which is completed rapidly and does not involve trenching. Therefore the pipeline improvements would not significantly affect biological or cultural resources, disrupt traffic, result in reduced access on city or UC Berkeley streets, or result in substantial construction noise. The impacts would be less than significant.

Mitigation Measure: No project-level mitigation measures required.

Helios Impact UTILS-2: The proposed project would require the construction of new stormwater drainage facilities, the construction of which would not cause significant environmental impacts. ***(Less than Significant)***

Implementation of the Helios project would increase impervious surfaces on the LBNL site by approximately 2 acres. The project includes design features including underground stormwater detention facilities, in order to minimize post-development stormwater runoff at existing levels, so that additional stormwater runoff is not discharged into No Name Creek or Strawberry Creek. For additional information regarding the design of the proposed stormwater facilities, see **Section 4.7, Hydrology and Water Quality**. The environmental impacts from the construction of the proposed stormwater facilities are addressed in other sections of this EIR, and as shown in **Section 4.3, Biological Resources**, and **Section 4.7, Hydrology and Water Quality**, with mitigation, the environmental impacts from the construction and operation of these facilities would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact UTILS-3: The proposed project would result in the need for additional chilled water facilities, the construction and operation of which would not result in a significant environmental impact. (*Less than Significant*)

LBNL does not maintain a site-wide chilled water distribution system. LBNL buildings that require chilled water are supplied by on-site chillers and cooling towers. Therefore, implementation of the proposed project would not impact any centralized chilled water distribution system. The Helios project proposes up to eight cooling towers that would meet the demand of the proposed project and would be located adjacent to the northern side of the building. Construction and operation of the cooling towers is not expected to cause any specific significant environmental impacts beyond what is analyzed for the proposed project in other sections of this EIR, notably **Section 4.1, Aesthetics, Section 4.2, Air Quality**, and **Section 4.9, Noise.** As the analyses in those sections show, the environmental impacts from the construction and operation of the cooling towers would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

Helios Impact UTILS-4: The proposed project would create additional demand for electricity and natural gas, but would not result in the construction of new or expansion of existing transmission or energy production facilities. (*Less than Significant*)

The proposed project is anticipated to require 4.4 million kWh per year of electricity and 10,000 therms per year of natural gas. The Helios project includes numerous energy-saving measures, including Photovoltaic (PV) panels, energy-efficient lighting and building systems, and design features to reduce heat gain. The additional electricity and natural gas to the proposed project would be delivered to the project site by the existing infrastructure at LBNL. No off-site improvements are required. The impact is considered less than significant.

The project's demand for electricity by itself would not require the construction of new power generation facilities, and the project's impact related to off-site generation facilities would also be less than significant. The project's demand would, however, combine with the demand for electricity associated with other proposed projects in the region and could contribute to the need for an expansion of an existing power plant or the construction of a new power plant. Sources of electricity are diverse and widespread, and supply is usually made from a number of sources. Both electricity and gas needed by the project may in fact be generated out of state. It is therefore not reasonable to predict where the supply sources would be located or to evaluate the environmental consequences from the construction and operation of such facilities. Furthermore, if the new power generation facilities were to be located in California, they would be subject to environmental review and would be required to avoid or minimize their environmental impacts. Accordingly, the project's contribution to the impact related to new generation facilities would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

4.13.5 References

Energy Management System. Energy Consumption and Cost Report, Lawrence Berkeley Laboratory, January 1, 2007.

Lawrence Berkeley National Laboratory. 2007. 2006 Long Range Development Plan Final Environmental Impact Report, SCH No. 2000102046, July.

Pauer, Ron. LBNL Environment, Health, and Safety Division. Strawberry Canyon Monitoring Station Monthly Flows 2006-2007.

Winzler & Kelly. 2005. East Canyon Sanitary Sewer System Study Report for Lawrence Berkeley National Laboratory, August.